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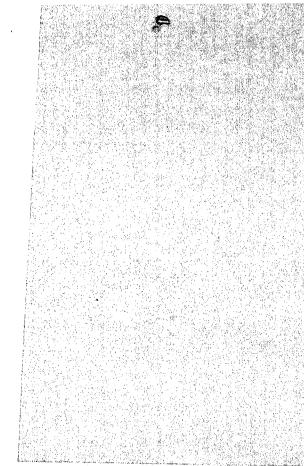


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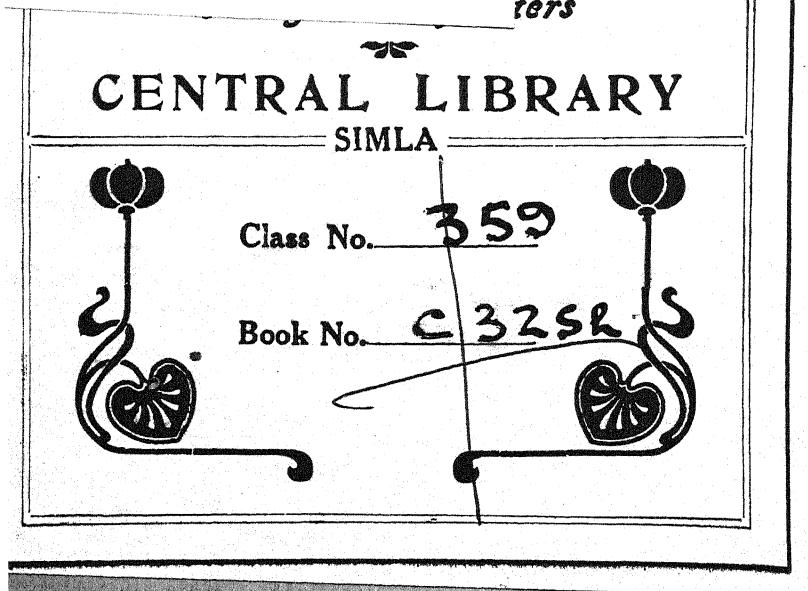


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The SHIP UNDER SAIL

BOOKS ON THE SEA BY
E. Keble Chatterton

HISTORICAL

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SHIPS AND WAYS OF OTHER DAYS
FORE AND AFT: THE STORY OF THE
FORE AND AFT RIG
STEAMSHIPS AND THEIR STORY
THE ROMANCE OF THE SHIP
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KING'S CUTTERS AND SMUGGLERS
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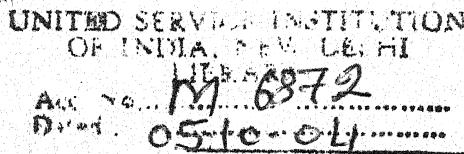
The SHIP UNDER SAIL.

The Splendour of the Sailing Ship through the Ages. By E. KEBLE CHATTERTON,
Author of "Whalers and Whaling," "Seamen All," etc.

223

WITH 36 ILLUSTRATIONS

359



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P R E F A C E

MY object in the following chapters has been to present the reader with a clear and concise account of how the sail-propelled craft developed in its long evolution from the dug-out to the five-masted barque of the twentieth century. It is now seventeen years since I wrote my *Sailing Ships and their Story*, which has been accepted in Europe and America as a standard work. But a new generation has since grown up, a fresh phase has come over the sailing ship, a big war has intervened, and there has been begotten a vast interest in the subject which did not exist a couple of decades back.

In the meanwhile, I have been able to spend some years in further research, and the result here aimed at is a clear, vivid idea in accordance with the latest knowledge, illustrated by a wealth of prints, paintings, ship models, and other examples which enable us to follow the vicissitudes and modifications of the ship under sail. We see here not merely the alterations in rig and hull, but the conditions of sea life, the problems and progress which have concerned the vessel until long after steam came in, down to the present day. So far as possible the account is illumined by documents and illustrations of contemporary date. This is, then, an entirely new volume intended for all who love ships and seafaring.

P R E F A C E

When first these chapters appeared serially so much interest was aroused, and so many readers who were not themselves seafarers wrote, expressing a desire to possess this account in more permanent book form, that the whole has been revised and illustrated afresh. In this respect I am especially grateful to the Pepysian Library, Magdalene College, Cambridge, for those unique reproductions (once owned by Samuel Pepys himself) of certain seventeenth-century ships; to the Science Museum, South Kensington, for permission to reproduce various ship models, prints, and drawings; to Messrs. Ramage & Ferguson, Ltd., for the sail plan of the *København*; and to Messrs. T. H. Parker, 12A, Berkeley Street, W., for the use of several valuable old prints. In the course of a twelvemonth so many letters continue to reach me from both sides of the Atlantic asking for further information, or finding that several of my books are out of print, that it is hoped the present volume may satisfy what is desired.

E. KEBLE CHATTERTON.

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THE SHIP UNDER SAIL

CHAPTER I THE EARLIEST OF ALL RIGS

INASMUCH as the human race sprang from the land and not the sea, all the nautical arts of shipbuilding, rigging, and handling were a matter of slow and costly development. It is easy enough to imagine that as soon as they had the requisite tools, and the knowledge to use them, our early ancestors dwelling by the river-side would construct boats. And, since human nature has always preferred to go by the way of least resistance, one may legitimately assume that a sail was devised and fitted to that river-boat as soon as practicable, especially in a country where the wind is constant and not variable as in our part of Europe. All this may be conceded in the absence of actual historical proof, and there can be little doubt but that the first boat to be used was on the river and not the sea.

But from this point we may start, well knowing that we have sound evidence for our statements as opposed to interesting theory ; and we begin with ancient Egypt, for the reason that it affords the earliest knowledge which exists on the subject of boats and ships. During the last

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sixty years Egyptian exploration and study have revealed a veritable wealth of real romance, and the recent sensational discoveries are too well known to require mention.

We may leave out palæolithic races which inhabited Egypt at a time when the rainfall was there far greater than it is now and the Nile was a much wider river. The first continuous civilisation of Egypt begins about 7000 B.C., and in that period there were not merely improved flint knives, but copper adzes and needles. The spinning and weaving of linen cloth became important activities, and thus we have here, with the local timber, the tools and material for making the Nile sailing craft. The manufacture of vases and the art of glazing had already reached a high stage of production.

Now the very earliest picture of a ship that I know of is that on a vase which was discovered in Upper Egypt and is now in the British Museum. It belongs to the period of about 6000 B.C., and the draughtsmanship, though crude, shows perfectly clearly that the oldest Nile ship had a mast, across which is stretched a square, or rather, oblong sail. And we may at once state that it is the squaresail rig which has been the dominating type until steam made it obsolete, and left the glory of wind-propelled craft to be carried on, as it is to-day, practically exclusively by fore-and-afters. In this simple and crude vase drawing we have the germ of that lovely creature which was eventually to grow into the full-rigged ship after many long centuries. And because it is through the ship that religion and learning, civilisation and commerce have been spread, explora-

THE EARLIEST OF ALL RIGS

tion and empires have been made possible, every advance and improvement in ship-propulsion become to us of the greatest conceivable interest. For without the ship and sail the whole story of the world would have been altogether and utterly different. The history of maritime progress is the history of the universe.

Somewhere about 5000 B.C. the Nile Valley was invaded by the dwellers from the Red Sea; but these people possessed great artistic ability, and, uniting the land, founded dynastic history. They were filled not merely with the instinct of the sea but with a wonderful love for symbolism, and we shall see how this was to affect the subject before us. The first Egyptian dynasty begins in 4777 B.C. and the thirtieth does not end until 340 B.C., but during that period the ship was to become a really beautiful and scientific creature: sweet-lined in the design of hull, with overhang at bow and stern, scientific in the actual building (such as guarding against strains and stresses by a powerful rope truss), and possessed of a carefully thought-out rigging and sail-plan. It will now be our pleasure to look at the latter in detail.

Everyone knows that local conditions usually bring about the best influence towards producing the ideal craft for any particular locality in any particular age. The variations in types of fishing craft round our coasts to-day afford excellent instances of this principle. Now the conditions in Egypt are that the Nile flows constantly from south to north, and the prevailing wind is from north to south. We have no reason to assume that these Nile craft

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could beat to windward ; on the other hand, we do know that the masts were made so that they could easily be lowered and that the crew then used their oars. Thus the shallow, but wide, oblong sail drove the craft over the current when going south ; and with practically no top-hamper the vessel was easily rowed north coming down with the stream.

What is our evidence ? It is found in the mural paintings of these contemporary buildings, where every conceivable detail is shown to satisfy the ardent ship-lover ; and it is found in the delightful little model ships or boats which have been found recently in the tombs of Egypt. These craft were considered to be a necessary adjunct to the comfort of the dead, and the symbolism is delightful. They were placed with the deceased so as to provide him with the means of voyaging about on the waters of the underworld. The souls of the beatified were also believed to travel nightly in the train of the Sun-god from west to east. There are special references in *The Book of the Dead* to such things as the sail, the hold, and the oar-rests. No one with the amazing ability, the artistry, the enterprise of these wonderful Nile-dwellers could fail to respond to ship-instinct which was suggested by their immediate environment. Not merely for the calm waters of their own stream but for the summer Mediterranean Sea were vessels to be built. Trade between Egypt and the Greek Isles was carried on, and found in the Egyptian tombs are traces of pottery from lands across that sea. Men who could build the pyramids constructed sailing ships, and did their work remarkably well.

THE EARLIEST OF ALL RIGS

The rig of a Fifth Dynasty craft, such as was used for Nile work, is most intriguing. The period is covered by the dates 3721-3503 B.C., and shows how highly skilled these early shipbuilders were. We are concerned primarily with the rig, so we must concentrate attention first on the mast. This is shaped like the letter A, and this custom continued from the Third to the Eleventh Dynasties. This bipod mast (not altogether dissimilar in principle from the masts in our modern light cruisers of the British Navy) fitted into grooves at the deck and originally required neither backstays nor shrouds; but as the vessel became bigger or the mast lighter, backstays were added in the Fourth and Fifth Dynasties to counteract the strain of the tall narrow sail which at that time was the fashion. Note, if you please, that the sail was bent to a yard, but at present there was no boom. The yard was controlled by braces, and we do see an additional stay leading from the masthead to the extreme end of the craft's counter-stern. Very similar to this is the Burmese junk, which is barely obsolete. She is similar in A-shaped mast, in the square-sail, in the steering-paddle or rudder at the *side* of the stern, and very similar, too, in the shape of the hull with its great overhangs at bow and stern.

Why is it that this fairly modern Burmese and that Egyptian ship of five thousand years ago are so strangely alike? The answer is that the local conditions are so similar. The junk sails up the river Irawadi before the wind and comes down with the current, and she has done that through history from time immemorial. And if only

THE SHIP UNDER SAIL

the data could be discovered, how interesting it would be to show that the Chinese junk also came from a common ancestry! But we shall be navigating dangerous waters if we start these vague ideas in the absence of actual evidence.

It is to be noted that the steering arrangement consisted of paddles placed, not at the extreme stern of the boat, but on the quarter. And this custom was to exist for many hundreds of years through the Mediterranean craft of classical Greece and Rome, through the Viking ships of northern Europe, right down to the vessels of mediæval England. At first this Egyptian steering is done by one or more men paddling in much the same way as one uses a paddle to steer a Thames punt. In big craft the Egyptians used as many as five steersman. A look-out man with his sounding-stick was located forward, the captain of the ship with his thong-stick for urging the crew, and the pilot seated on the top of the small deck cabin shouting his orders to the steersman at the warning from the look-out man, are all shown clearly in these old pictures.

But after the Fifth Dynasty the shape of the sail becomes wide and shallow, and instead of the steersmen with their paddles we have one large paddle which, resting against a big wooden fork, by means of a lanyard is worked with one man only. This is the predecessor of the rudder that was one day to be introduced into European ships. But if this dynastic period was famous for its general prosperity, its magnificent works, its genial and sensible people (as we know from the grandeur of its private tombs, the

THE EARLIEST OF ALL RIGS

rich sculpture, and the collection of proverbs which have been discovered) it was unfortunately followed by a time of decadence, much as we suffered in England after the brilliant Elizabethan epoch.

We can therefore pass over the intervening years till we come to the Twelfth Dynasty (2778-2565 B.C.), when the country produced excellent work again. There exists a capital couple of tomb models belonging to this period showing the contemporary ship first with masts and yard and boom, lifts, braces, halyards, and sheets complete, the look-out man forward with his stick, the steersman aft controlling the huge steering paddle with his lanyard, the crew amidships attending to sheets and braces. The second model shows the sail stowed, the mast lowered in a tabernacle, a heavy stone lashed at the proper place to render the raising easier, and the cabin-top takes the weight of the mast. Ten oarsmen are seen rowing, while the look-out man and steersman do their own work.

But it is when we come to the ship illustrations of the Temple of Deir-el-Bahari that we find the most fascinating details. In fact, there is scarcely missing anything that we should wish to have known. We are now in the Eighteenth Dynasty (1587-1328 B.C.), which has been called "the most showy and best-known age of civilization." At any rate the nautical arts reached a marvellous state of proficiency in this period, for they were really beautiful craft, and they were sea-going rather than mere river-boats. The enormous overhang at bow and stern will surprise most yachtsmen, but all risk of hogging was

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overcome by the thick rope made fast at the prow. This rope led aft on forked posts or fairleads to the counter. It was as thick as a man's wrist and capable of withstanding a strain of 300 tons. For the protection against spray the craft was built up both in the bows and stern, and from the solid nature of the rigging such craft were unquestionably intended for the Red Sea or Mediterranean. They were decked, too, the hold being used for such cargo as gold and incense, elephant-tusks, ebony, skins, and so on.

Steering was done by that huge paddle at the side. As to the shallow wide sail, its yard was of two pieces lashed together in the centre. The sail was hoisted by a couple of halyards which led aft and were used as powerful stays for the mast. The boom was lashed at its centre to the mast by thongs, and this spar also was in two pieces. The ends of the boom curved upwards, and were not straight as we are accustomed to see them. About seventeen topping-lifts supported the boom's weight and that of the sail; for when this sea-going craft encountered a head wind, and lowered her square-sail, the two halyards were let go, the boom remained standing and both yard and sail were stowed along this fixed spar.

We can think of these fine ships going down the Red Sea to the Land of Punt, or emerging from the Nile to the coast of Syria and through the Grecian archipelago. Clinker-built, they carried large crews, rowing about fifteen oars each side. Sailors are depicted going along the boom holding on to the topping-lifts, and the oars are shown to be worked not in rowlocks but in thongs. But now the mast

THE EARLIEST OF ALL RIGS

is a stout single spar, not A-shaped. It has a forestay and a backstay but no rigging at the sides.

From about the year 1250 B.C., however, there came an interesting innovation which was to have a permanent effect on the future development of the world's shipping. The boom was abolished, and it requires little imagination to suppose that this was the result of greater experience in the open sea as compared with the sheltered river. The sail was now furled, not by slackening away the halyards, but by being brailed up. Thus the yard remained standing, and about four ropes hanging from the yard were used for stowing on coming to an anchorage. This made for increased convenience in handling, since it avoided the necessity and exertion of lowering and hoisting that heavy spliced yard. Instead, it was simply a matter of sending hands aloft. Thus, for instance, we have in effect much the same sort of thing as in the foresail or mainsail of a twentieth-century full-rigged ship. This modification is historically most important, for it was to be accepted by the Phoenicians, Greeks, and Romans, and it was to be adapted later by the caravels, the caracks, and the galleons.

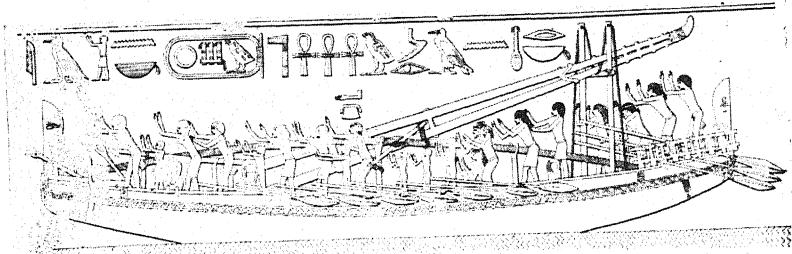
We know that the galleys of Rameses II used to run regularly between Tanis and Tyre, which was not the calm passage such as up the Nile. Their navigation consisted of coasting, fixing their positions by well-known land-marks, but lying-to during the night hours. And it was the custom of the Mediterranean sailors to voyage only in the summer months, the vessels being hauled up

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for the winter, as many small craft are in our own country.

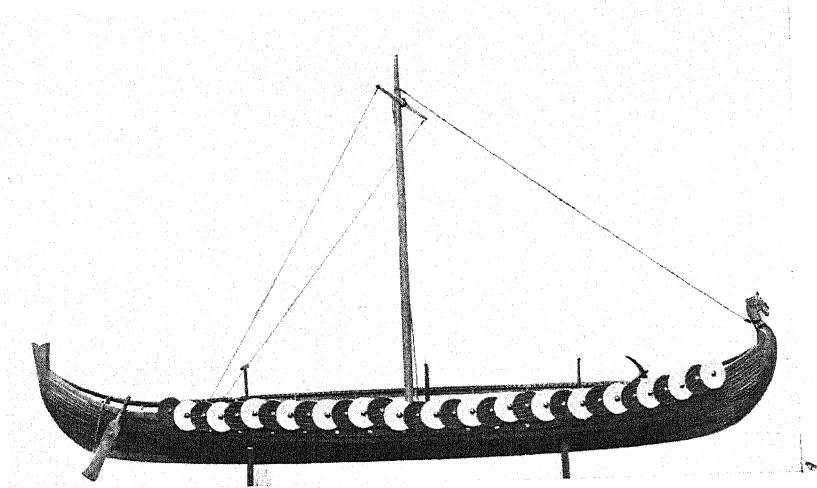
Egyptian ship-building was no "side-line," but a most important occupation. Contemporary illustrations belonging to the Sixth Dynasty (3503-3335 B.C.) show a shipwright's yard in a state of great activity. Men are seen hammering and chipping away at the wood of the ship, fixing that truss to prevent hogging, while the supervisor or manager is carried along in his chair to see what progress his hands are making. Large supplies of wood were being used even by the end of the Third Dynasty, and in one year Senofern imported forty ships of cedar in addition to building another sixty. The masts were of fir imported from Syria, the sails being of linen, but sometimes of papyrus. That these early people could construct and launch quite big craft is proved by the fact that Sesostris had a sacred barge built whose length was 280 cubits.

But there is one question which the reader will almost certainly have been asking for some time. Did these Egyptian ships ever go to windward under sail? Had the art of tacking been yet invented? After having devoted a very considerable time to investigating the subject, I can find neither in pictures nor literature the slightest reason to suppose this invention had yet been brought about. Right through maritime history we know that ocean-going ships either made a fair wind of it or could not sail close to the wind. Even to-day how often one comes across topsail schooners waiting weeks for a fair wind before sailing even as far west as Ireland!



EGYPTIAN SHIP. (*Circa 2600 B.C.*)

From photograph in Science Museum, South Kensington, of bas-relief discovered during the 1902-8 explorations. In this picture the A-shaped mast is lowered and the crew are rowing down stream. Notice the truss to prevent hogging; and the three steering paddles.



MODEL OF VIKING SHIP.

The lines of this Norse "long-ship" may be compared with those of the Egyptian vessel above. The period represented is of the eighth to tenth centuries.

(In Science Museum, South Kensington.) (See p. 39.)

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At the same time it is only reasonable to suppose that seamen accustomed to use narrow channels, or to have to make a long voyage back home against the prevailing wind, would sooner or later learn so to devise a sail-plan that the vessel would go against the wind. The whole art of seafaring has been of slow and conservative development, and it is only during the nineteenth and twentieth centuries that more revolutionary changes have taken place than in thousands of years. To say who introduced the fore-and-aft rig would be mere presumption. It was certainly not the Egyptians, Greeks, Romans, or any other people of ancient times. It is quite likely that the Arabs who were in Egypt by A.D. 641 brought the idea with their dhows; and mediæval Portugal and Spain were to learn much from Arabian seamen which was to be of inestimable benefit in the long historic voyages that were to discover unknown tracts of the world.

But at any rate there is reason to suppose that when it did arrive, the fore-and-after sprang from no country to the west of Egypt, and I think we can see how the notion took birth. As it is impossible to put back the clock, we must go to some part of the world where the human race has had enough intelligence to use the sea, but has remained more or less conservative for a very long period. We may well choose the Java Sea for our purpose, and here we find what seems to me the transition stage of the old Egyptian square-sail on its way to becoming the fore-and-after. If you take that wide but shallow oblong shape with its yard and boom, tilt it forward so that it is no longer at right

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angles, but the foot comes down low and the peak is way high up in the air; if you also move the mast well forward, you have in effect created the fore-and-aft rig that will enable the ship to go against the wind.

Such craft still survive in the Soerabayan prau of the Java Sea, and Muhlhauser gives a photograph in his *Cruise of the Amaryllis*. I have seen in a sixteenth-century Dutch picture of these craft just that same kind of sail, and if you look at the Egyptian nugger which is still in use to-day on the Nile above the second cataract, you have the same thing again—the old shallow square-sail tilted forward to make a kind of lugsail. After that development it was of course quite a short step to the Arab dhow from which the lateen rig of the felucca is so clearly descended.

Thus we have now reached in this chapter the stage when the Egyptians bequeathed to us a serviceable rig, after thousands of years' experience on river and sea. The fore-and-aft plan was to come much later, but in general the lines had been laid down for future development. As ships became bigger, obviously they would require more masts and more square-sails; but those great yards with their brails and halyards were on the sea now for all time until the coming of mechanical propulsive power. Labour was cheap, human lives were of little consequence, slaves were abundant: so when the wind came ahead, men were sent aloft along the yard, the sail was brailed up, rowers got out their oars, and the steersman controlled his ship by the heavy paddle affixed to the quarter.

We shall see in the next chapter how the Phoenicians,

THE EARLIEST OF ALL RIGS

Greeks, and Romans accepted these Egyptian ships and modified the rig for their own special uses. But it is essential first to bear in mind that the Egyptians were not fundamentally fighters, but peaceable people who enjoyed beautiful things: and nothing better than those interesting, well-designed craft which they built so well.

CHAPTER II

THE EARLY MEDITERRANEAN SHIP RIGS

IN the history of the world it would be difficult to find a keener race of seafarers than the Phoenicians, and for this reason they certainly are to be held in reverential respect by all of us who are indebted to ships, whether directly or indirectly.

Nothing is so calculated to develop the nautical arts as residence along a maritime coast, for sooner or later there must evolve a living interest in shipping. Now the Phoenicians had originally come from the Persian Gulf and inhabited the Syrian coast. Thus they settled on the Mediterranean shore, with Sidon as the oldest of the Phoenician cities; and it is to be noted that though Phoenicia had its terraced, rocky slopes, its vineyards, its olives, and so on, yet these people were never farmers, but always sailors. They depended, not on agriculture, but on oversea enterprise. They had indeed practically a monopoly of the Mediterranean carrying trade, and an actual monopoly of the valuable purple dye trade. Dyeing with purple obtained from the purple shell-fish was in fact the foundation of Phoenician wealth, and gave an enormous impetus to its seafaring, just as China tea was the means of encouraging our clipper ships in the nineteenth century, or the

THE EARLY MEDITERRANEAN SHIP RIGS

export of coal has aided the tramp steamer in our own times.

Wherever there was a suitable harbour, the Phœnicians established factories and settlements for their dye trade along the Syrian coast, on the islands of the Eastern Mediterranean, in Sicily, Sardinia, on the North African coast, and even just outside the Mediterranean, at that Spanish port we now call Cadiz. Thus this enterprising people became at once the richest in the ancient world and also the finest race of seamen. And even when they fell on evil days and were conquered by the Persians, their navies and maritime knowledge were invaluable to the vanquishers. But at last the Greeks were to become masters of the great Mediterranean trade, the Phoenician island of Cyprus became Greek too, Tyre and Sidon had been destroyed; the great Phœnician glory perished.

What, then, did the Phœnicians contribute towards the ship? The answer is that they modified the Egyptian Nile craft for purely open-sea work, and created a type out of which the Greeks and Romans were to develop, in turn, their own craft. Thus the Phœnicians took the Egyptian hull as a basis, and left it little altered except at the bows. That sweet-curved overhanging stern remains with the rudders at the quarter, but the overhanging bow has given way to a long ram rather similar to the long fore-foot which was used by some of those battleships in the nineteenth century at the time when the "knock-out blow" tactics were so popular in European navies. Phœnician coins show this modified Egyptian hull with a row of shields

THE SHIP UNDER SAIL

to protect the crew. But it is the rig that we are especially concerned with. This consisted of one mast farther forward than amidships, and this one mast carried a square-sail which was used in fair winds. At other times the vessel, because of her lines and shallow draught, could be manœuvred quickly by means of her oarsmen.

The yard is fixed, and remains standing. There is no boom, but the sail is shortened or stowed by half a dozen brails, hands being sent aloft as required. According to the evidence of existing coins the stow was not a neat one, and the windage when the craft was rowed against the breeze cannot have been small, for the sail hung down in four baggy bunts. Still, these were pioneer ships and must be judged by the standard of their own times. And, seeing that the Phœnicians were able to navigate not merely the Mediterranean, but the Red Sea, the Indian Ocean, and the Atlantic, no one can deny that they knew their job. They had, in a word, a well-designed hull of great mobility, impelled either by oarsmen or by one simple single square-sail that could be shortened to nothing both quickly and easily. It was a composite vessel in the sense that it could go anywhere, could carry its dye-cargoes, could fight pirates or run away, was convenient to handle in shallow waters or at sea. There is nothing like actual sea experience for proving the value of rigs and hull-design ; and the Phœnicians, by their long voyages, had certainly created a fine type which their descendants could modify if they liked.

By about 700 B.C. the Greek ships possessed the Medi-

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terranean carrying trade. It must be remembered that the Greeks were fighters and that Mediterranean piracy was rather an honourable profession than a crime. War on sea became both highly organized and continuous, so we must expect now to find that hostile influence in respect of the Greek ships. In no respect is this influence more clearly seen than in the use of the ram. The Greek warship was in effect a kind of glorified spear-head, and the tactics were spearing or ramming. Therefore the fighting craft were designed and built with a view to the utmost mobility. Hardiness in ramming was the very first consideration. Hence for these craft reliance was placed less on sail than on oarsmen; hence, also, we get biremes and triremes in order that the ship may be above all things fast. The mast and sail, you see, suffer an eclipse. We have to think of the battle arrangement of these fleets in order to realise how little use sail was to them except when making a passage to or from an engagement. We must see in our minds rival fleets entering battle in line abreast as close to each other as their oars allowed; then the crash and shock when beaks became bent and blunted by ramming, when attacking ships were rendered injuries as serious as those vessels holed by the rams. We have to think, too, of the spears thrown by fighting men, of swordsmen, of missiles slung from deck to deck. Entirely contrary to modern battle practice by sea, engagements were fought not at long distance with the enemy scarcely visible on the horizon, but as close as he could be approached.

Therefore the rig of the Greek ships must be carefully

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studied. First, we have the galley type of craft. She is intended especially for fighting, and so must be easily handled. We are not surprised to observe in Greek vases that such a ship relies chiefly on her fifty oars than on her small sail-plan: for the sail is auxiliary to the oars. This is still a square arrangement with standing yard and no boom, hoisted by a couple of halyards. The brails are as many as eight and are used for reefing. Both Aristophanes and Euripides use the expressions "to keep the sails close-reefed," "under close-reefed sails," or literally "with the outermost edges of the sail."

Secondly, we have the pure merchant type of ship now evolving from the Phoenician model. In this craft the Greeks employed a similar single mast and square-sail as the primary means of propulsion, oars being used as auxiliaries. Big-bellied, she was usually built of pine throughout. Thus we have come to that part of the genealogical tree where the ship-family branches in two directions: the galley, or long-ship, the merchantman or round ship. There are Greek vases in the British Museum which show that in some cases the fifty-oared war galley used her reefed square-sail even when the rowers were at work, but that when the wind was ahead and the men were rowing and the square-sail brailed up, these brails led aft to the steersman, who could thus slack off and set sail immediately the wind came fair.

Each yard was still made of two spars lashed together, masts, yards, and oars being all made of fir or pine. Before battle the mast of a galley was taken down. The

sail was made of several pieces of white canvas, or cloth, frequently coloured, black for mourning, purple or vermilion for an admiral or sovereign. Scouting craft dyed both sails and ropes the colour of the sea in order to camouflage themselves.

Ropes were made of the fibres of the papyrus plant or of twisted ox-hide, the edges of the sail being also bound with hide. As we are not concerned here with the debatable arrangement of the oars in triremes and biremes, we may content ourselves with remarking that the former had two suits of sails and two kinds of masts; but before setting out for battle the larger sails and masts were put ashore. It is evident that these bigger sails were of considerable size, for a trireme carried as many as eighteen brails. The smaller gear, consisting of mast, sail, and yard, was known under the generic name of "akation." The word "akatos" in Greek meant a light craft—the "actuaria" of the Romans. But "akation" strictly meant a small sail, and thus in Greek sailor parlance the phrase "hoisting the akation" meant "running away" from the enemy. We see yet again that the Greek admirals had little use for sail when in battle.

Rome was largely indebted to Greece both in regard to ship-types and ship-rigs, just as Greece learned from the Phoenicians. And from Xenophon we know how meticulously the Mediterranean merchantman stowed his cargo, his cables, and spare spars before leaving port. From him we know that the pilot's mate or "look-out man" as he was officially known, was responsible that all gear

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was on board, and for knowing where every item was stowed. It was the custom to voyage not during the winter, but on the return of spring when "the soft leafage laughs in the meadows," the "soaked cables" were wound up from the harbours, and the crew were able to "stretch the forestays to carry your well-woven sails." It was the fitting-out time, as we should call it.

Homer refers to "stepping the mast," and there were two forestays. Homer also confirms the act of brailing the sails by the use of the word "meruemai." It is the same word which is employed for the operation of hauling up the cables. Euripides uses an expression "kalos exienai," with the meaning to let out the brails or reefs. And it is interesting to note that when the ship was sailing as near the wind as she could profitably go, the sail was brailed up on the after part of the yard.

But while the swift-moving fighting galley, easy to be built, easy to be hauled ashore, continued to dominate any warship development, there was a real but restricted demand for the Mediterranean merchant ship. She became a high-sterned, seaworthy, slow-moving craft with one enormous mainsail setting above it a triangular topsail. The forestay is a thick, substantial rope, the mast is supported on either side by rigging with dead-eyes, and the lifts supporting the heavy yard are also of considerable strength. The rudder is still on the quarter controlled by a helm.

But there is now an additional spar, a highly steeved bowsprit. This is called the "artemon." On this small

foremast or bowsprit was sometimes set an "artemon" sail. This sail was known by the same name as the spar. Thus in the Biblical account of St. Paul's voyage we find that after his ship had been compelled to slip anchor they "hoisted up the artemon and made towards the beach." In other words, it was akin to the seamanship of a modern yachtsman or fisherman setting his staysail to shift berth. The Greek of the New Testament actually uses the word "artemon," but the translation of this word as "mainsail" in the Authorised Version is quite wrong. Anyone who has cruised along the other side of the English Channel knows that the French word *misaine* signifies, not mizzen, but foresail.

This artemon is the forerunner of that fuller, more complex rig which we shall discuss in a later chapter, but it is quite interesting to note that certainly by St. Paul's time it was in use by the corn-ships which were wont to go across to Egypt. And there is in existence a splendid picture copied from a relief found near the mouth of the Tiber showing Roman merchant ships of about A.D. 200, which correspond to such details as are given us regarding St. Paul's vessel. Indeed, it is to this corn trade that the development of the Greek and Roman merchant ship is largely due. These voyages took place in the season from March to November, and the shipowners formed themselves into corporations of *navicularii marini*.

It is important to note why these corn-carrying craft were big. (In the Pauline account you will recollect there were "two hundred, threescore, and sixteen souls." And

Lucian, who lived about A.D. 120, speaks of one such vessel carrying so many souls that "would make one think it was a camp.") There was every incentive to build them large, for Rome's victualling largely depended on this Egyptian corn, and the owners were granted special privileges only on condition that they possessed a capacity of 10,000 modii and that they carried corn to Rome for six years. Thus it was to the shipowner's interests that he owned a large, well-built vessel. This, in turn, meant a good sail plan, sound gear, and the best seamanship. Thus, what war did for the galley, corn did for the merchant ship, and from now onwards we begin to see the freighter developing into a real ocean-going vessel. Too much, in my opinion, has been made of the Mediterranean galley consistent with the story of ship development. That mobile man-of-war never did much for the development of sail and rigging, for the reason that she rather despised them at the expense of oars and slave rowers. But the merchantman had every incentive to improve her sails and gear wherever that was practicable. To get her valuable cargo to port safely and quickly across a pirate infested sea, after coasting along shores badly lit—that was her duty, and she must not fail.

Looking at the relief discovered near the Tiber, we can see how studied has been the care to produce a reliable and well-found ship. Everything about this corn-freighter suggests such solid strength and wholesomeness as we find to-day in, for example, the Brixham smacks. We notice in this Roman craft the rudder-bands mentioned in the

Pauline account, but also good hefty bollards both forward and aft for mooring. There is a purchase for bousing that big forestay down tight, and there are dead-eyes for the artemon mast, but the arrangement for stowing sail is even still more interesting. A couple of hands are seen along the yard of one ship, while another man is climbing aloft. They are naked, for it used to be the custom for seamen to dispense with their clothes when going up aloft or out along a yard, the intention being to be free in their movements. Incidentally by this time the yard is of one spar, and not two lashed together.

Both sheets and braces are shown, while for stowing or reefing, the brails pass through rings on the fore side of the sail, leading just above the luff, and then to the stern, where they can be controlled by the captain. The operation would therefore be reminiscent of the way the Chinese junks reef their sails. Many domestic blinds made of slats of wood are hauled up in the same manner. It was already the custom to decorate mainsails with devices.

These corn-ships, then, were the great merchant vessels of the Mediterranean, and from the time of Diocletian (A.D. 245-313) they were under state control as government transports, carrying also cargoes of oil, wood, and bullion from the provinces to Rome or Constantinople, and also the imperial post. It was a highly important undertaking, for the shipowners were responsible to the State for the goods carried, and in return the State paid them a fixed percentage. But the corn-ship owners were allowed to engage in private trade, and to land their goods free of

customs duty. The seaman's life has always been a vocation apart, but this corporation of shipowners was the closest and most exclusive of all societies, membership being handed down from father to son. But it was all for the good of the State that the corn-ships should have every encouragement, and it was Augustus who was wise enough to understand that a Roman fleet in being was necessary to keep the sea free for the safe passage of these vessels between Italy and Egypt.

We have somewhat stressed this particular type of sailing craft, partly because it has been so much neglected and glossed over, but especially because in the early Mediterranean freighters, we have the germ of the future big-bellied craft, which were to make great explorations, and guide the history of the universe. The square-sail in these round Roman craft had by the year A.D. 200 become no experimental thing, but a reliable arrangement with improved brailing methods, and a second mast with its artemon to be used as required. Thus, there was already faith in the ship, capital was expended in building more ships, there began to grow up a sailorhood quite apart from those who wished to go roving as pirates or were destined to fight in the galleys. And this demand for shipping continued, so that the Mediterranean trade increased. By the sixth century A.D. these voyages had become of frequent occurrence, and already by the eighth century Venice was becoming a great trading port, and its merchants realised the important fact that the sea was not something to be dreaded, but a ready and sure means of amassing wealth. The stones of

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Venice to-day remain as visible memorials of that new belief.

But before we close this section, we must not forget to mention some of the smaller sailing craft of about A.D. 200. The *Corbita*, for instance, was a trading craft with mast and sail and steering oar at the side. The *Catascopiscus* was a fast sailing scout employed for reconnoitring. The *Actuaria* was similar, with mast and square-sail, the yard being supported by lifts. She is shown with a crew of three, and in light winds would be rowed by one man. The stern is rather that of the Phoenician, but the bow has a ram. There was also a special type of vessel, light and swift, called the *Myoparo*. The very meaning of the word "pirate" is one who attempts to rob, and this *Myoparo* was such a ship as Mediterranean pirates used. The *Prosumia*, the *Ponto*, the *Cladivata* (probably so-called after Claudius) were all special instances of the sailing craft at that time, and show that the interest taken in the subject was confined neither to the galley nor to the corn-ship. The *Ponto*, for example, was a vessel with mainsail and small artemon, the latter being supported by shrouds. The yard and sail were kept stowed until required. The *Cladivata* had also two masts with the brailing arrangements that we have already noted.

Thus, to sum up, we have seen that, following the excellent lead which the Egyptians set with their Nile ships, the Phœnicians, Greeks, and Romans adapted this rig and this hull design to suit their own particular purposes. And as time went on that development separated along two distinct

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lines—the galley and the trader—but in both cases the brailing square-sail with yard and without boom was retained. Every nation confirmed that convention, and the alterations were of details and not of principles. It was proof that the early sailor-men had learned their lessons, if slowly at any rate correctly. And now that we have seen the Mediterranean rig standardised, we may leave that sea for a while and endeavour to learn how in Northern Europe the early ships were rigged.

CHAPTER III

THE NORTH EUROPEAN RIG

THAT which for convenience we may refer to as the Viking rig became the standard, not merely for the Norse seamen, but for generations of sailors along the seaboard of Northern Europe ; indeed it was not till hundreds of years later that the rig became modified rather than abolished.

The first requisites for these Viking craft were a strong, seaworthy, well-designed hull, and a simple, easily handled, yet efficient sail plan. These were essential because of the waters in which such craft were to navigate : for every-one who has any knowledge of the heavy seas and hard winds off the rock-infested Scandinavian shore knows perfectly well that speed is of less importance than seaworthiness. Thus it is at once obvious that the Mediterranean war galley type, built especially for mobility, was quite unsuitable.

The Norsemen evolved, consequently, a sturdy, bold kind of vessel of heavier scantling, able to keep the sea in practically any weather, slow under oars, but faster under sail. We have to think of these craft voyaging, not over the warm waters of the Mediterranean, but through northern mists, parting the ice-cold seas. Now the Viking ships were no strangers to being at sea during the winter, as we know from the

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sagas ; and it requires a fine, healthy vessel to be able to use the northern seas in the dark months.

But they were manned by a race of men as virile as the ships themselves—men who had the most wonderful pride in their vessels, and loved everything about them. The sagas are full of such expressions as show the enthusiasm for the newly launched vessel, as for example : “ Her sides that in the water glow,” “ her serpent head with golden mane.” Then down the fjord towards the open sea the ship is rowed past the town with such perfect time that “ one stroke is all the eye can tell, all level o'er the water rise ” the oars. Nor do the sagas omit to mention the behaviour of these craft at sea, as for instance “ how through the gale the gallant *Bison* carried sail with her lee-gunwale in the wave,” or “ on the thundering wave the King’s men brave stay-ropes make fast, ’gainst the wild sea blast ” and “ close-reef the sail.”

The Norsemen would call the sail by such poetic expressions as “ The Cloak of the Wind,” “ The Tapestry of the Masthead,” “ The Beard of the Yard.” And there were whole fleets of such stalwart ships under way simultaneously, making a most imposing sight. There are actual references, too, in respect of lowering and hoisting sail. Thus “ he let strike sail and mast, and take down the vane,” and again “ he let raise the mast and hoist sail, and let set up gilded vanes, and the sail was white as snowdrift, and done with red and blue bands.” And because Erling Skialgson’s squadron sailed more quickly than the other ships “ he let reef the sail and waited for his host.” And we have this

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order: "He let call from ship to ship that men should lower the sails and somewhat slowly, and take one reef out of them."

Now what kind of craft were these Vikings? From the sagas we get all sorts of valuable information. The dragons and the long serpent or snake class were warships, but there were also ocean-going merchantmen, fishing boats, and local fjord craft. The knörr was so big that she could carry a hundred and fifty men, and used to trade across the North Sea to the Orkneys; but she was also used in war. She was first and foremost a sail-driven ship, but the long-ship relied not a little on her powerful oarsmen. The long serpents carried from twenty to thirty rowers aside. The dragon type was not mentioned till the late date of A.D. 868, and took its name from the dragon's head at the stem, the tail of the beast being at the stern.

It is to be noted that these Viking craft were never fitted with rams, as in the Mediterranean galleys; and yet the fighting tactics consisted of laying ship alongside ship, boarding, killing the men and cutting rifts in the ship both above waterline and below. One of the sagas refers to this holing with the delightful expression "hewed windows." Grappling-irons were hurled on approaching the enemy, and the ships were then bound together. The fight then began from the forecastle, where the most ferocious warriors were placed ready.

In order, then, to get these Viking ships clearly into our minds, we must consider them as double-ended in design, and, therefore, ideal in that respect for the heavy weather

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of the North Sea and Atlantic. The famous Gogstad ship, which of course still exists, was constructed of $1\frac{3}{4}$ in. oak planking, and her dimensions are 79 ft. 4 in. long, $16\frac{1}{2}$ ft. broad, and 6 ft. deep amidships. These ships were rigged each with one large square-sail, which was hoisted by a halyard, the yard being kept to the mast by parrals, which were called "rakki." A great deal of importance was attached to these parrals, and later on, when artists began to include ships in their pictorial representation, they were singularly careful to get this bit of gear correct, even when they erred in other respects. It is evident from these sagas that the Viking ships sometimes preferred to wait a while, even when the wind was dead aft, till the breeze should become on the beam, for these vessels sailed best when on a broad reach.

And this brings one again to that matter of whether these early ships did turn to windward. If they did tack, I can find no definite evidence, and in the absence of that evidence it is unwarranted to assume that each vessel did that which we should like to believe. When we read the voyages of the Tudor seamen, we see seven points to be the very nearest they ever brought their vessels to the wind, but they were content to wait months for a fair breeze, and even to up helm and run back if the wind headed them. And had it not been for their lateen mizzens, these ships would not have got as near as seven points: in fact, to sail so close was exceptional and slow. Read the accounts, too, of these ships and of later date trying to get round the Horn, and we see that beating to windward was never a virtue of the full-

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rigged ship until fore-and-aft headsails, staysails, and other improvements came in. In fact it was not till the clipper ship period that square-rigged craft ever made good passages to windward.¹ Tacking, you see, is really a modern practice. It has been confined for the most part to fore-and-aft rigged craft since the fifteenth century.

But to return to our immediate subject, the Viking sail had a single yard, the sail being much wider along the foot than on the yard. There was sometimes used a boom known as the "beit-i-ass," the object of which was to enable the sail to hold a better wind. This square-sail was made of home-spun, until later on came the cultivation of flax. Strengthened with rope at the edges, it was frequently striped, and sometimes embroidered or decked with pall. The parts of the sail were sewn together with thread, and there were reef points. A great deal of work was expended on their sails, which were made sometimes even of velvet, and wonderful embroidered affairs with striking designs were worked by their womenfolk. Hence the sail was known as "The Sheet spun by Women." It needs very little imagination to consider what a wonderful sight seventy of these craft made emerging from the fjord into the open sea and giving a marvellous splash of colour against the drab background. Seventy sail! Some of velvet double but plain, others with patterns woven into the velvet, of red, or purple or gold; and others just white sails striped with red and blue.

¹ "I have known a ship detained in Hamoaze three months waiting for a wind to get into the Sound," wrote Lord St. Vincent in October 1800. (*The Spencer Papers*, vol. iv, p. 20.)

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When the sail was hoisted it was said to be "topped"; when it was straining at the halyard it was said to be "wrangling with the tackle." Before a battle took place the sail and mast were lowered. This of course was done by first slackening away the halyard, and then the mast was lowered by means of a tackle on the forestay. Ordinarily the mast fitted into the "stalbr," or step, and stays supported it from the top to the stempost. There were also shrouds on either side. The braces led away aft from the ends of the yards. It was in such seaworthy ships that the Norsemen made those wonderful voyages across the North Atlantic to Iceland and Greenland and North America; to the Orkneys, Shetlands, Faroes, and Ireland; and to the Mediterranean also. This is certainly proof enough of their own seamanship and the seaworthiness of their craft. Greenland was discovered in A.D. 876, but it was not till 986 that Heriulfsson reached the North American coast from Greenland. There are those who believe that Columbus obtained the idea of his historic voyage when in Iceland in the year 1477, and here he might have heard of the wonderful voyage made to the westward in these Norse craft: for the traditional account of these trans-Atlantic voyages had been first committed to writing only eighty years before Columbus visited Iceland.

The theory is an interesting one, but, whether it is true or otherwise, we can be quite sure that the accounts of these single-sail Norse craft cannot have failed to appeal to Columbus's mind. To Greenland the Norse ships carried both women and children, animals and provisions, clothing

and baggage. The settlement in Greenland continued down till about the fifteenth century. And, as proof of the commerce that existed by sea in the North during the twelfth century, we have the Laws of Wisby, which were drawn up in 1150 to regulate overseas traffic. It is always a proof that shipping has become extensive if we find that laws have to be made to control it.

But these Northmen were so imbued with the marine idea that they used their ships not merely for war and colonisation and trade, but even for pleasure. There is the story of Harek being one fine spring day at home rather bored, so at Sigurd's suggestion they launched a six-oared craft, shipped the rudder, put into her a butter-keg, bread-basket, and a beer-cask; then, having rowed away from the land, the party hoisted sail and Harek steered.

These sons of the fjord used to take the greatest care of their craft, housing both ship and gear in sheds. Rollers were employed for bringing the craft under cover, and they were fitted out after Easter at the jetties. The method of rowing consisted in the oar being kept in position against the thole-pin, a strap keeping the oar from getting loose. The rudder still shows a very close connection not merely with the ships of the classical Mediterranean, but with the vessels of the Nile; for it is still placed at the side—the *stjernbord*, or steering-side. It is thus that the word "starboard" originates. This rudder could be unshipped and taken inboard, as undoubtedly it was when the ship was hauled ashore.

The Vikings used rope for their cables, and it is inter-

esting to note that here a fashion was started which existed, according to conventional evidence, until the year 1500 in certain craft. For these Norse cables were coiled round the beaks of their ships. At sea each oarsman kept his weapons ready in a chest underneath where he sat; thus the crew were prepared all the time for their duties of fighting, rowing, or seamanship. And it was in regard to their moral as well as physical qualities that these fine crews were most carefully chosen. These men slept under tilts, or awnings, spread across part of the ship when at sea; but in harbour the tilts extended over the entire vessel. Obviously before going into action these tilts had to be struck.

The seat of authority was aft, as in the Mediterranean ships, and there was a plank at the back of the seat against which the helmsman could steady himself. Immediately below the commander was kept the ship's arsenal, but if we reckon from forward to aft we must imagine the arrangement in these craft as follows: The standard-bearer and his mates were at the prow; then came the selected dozen forecastle men whose job it was to resist the enemy's attempts to board at that point; then were disposed next the thirty forehold men, and abaft of them were the men in the mainhold, and finally the commander at the poop.

Viking craft sometimes lay alongside piers, sometimes they let go their bow anchors and took a line ashore from the stern. The whole fleet would then secure alongside each other, bow to bow, stern to stern after the manner which still prevails among North Sea fishermen. Both

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food and water were carried in casks. It was customary not to carry cooks, but the crew chose by lots among themselves as to who should have the care of the mess day by day. All drink was in common, and the cask stood by the mast with a locked lid ; but when this drinking cask ran dry it was replenished from tuns.

The "stem men" we mentioned just now at the prow with the standard were, like the rest of their shipmates, "peerless both of strength and good heart and all prowess ;" but these "stem men" were the most tried of all. Each oarsman had about three and a half feet in which to work, and in the ships of war the rowing benches did not stretch right across, but a space was left to allow the fighting men to move easily fore and aft. The more one studies the work of these Norsemen, the greater becomes our admiration for all that they did. The famous Gogstad ship, unearthed in 1880 close to Sandefjord, belongs to a date somewhere between A.D. 700 and 1000. But these craft, on the whole, altered so very little that we have no difficulty in learning exactly how the famous ocean-going ships of the Norsemen looked.

It is worth reminding the reader of the few following dates to enable him to appreciate what was achieved in such vessels. In A.D. 787 the Norsemen sailed across the sea and landed in our own country ; in 874 they had begun to colonise Iceland ; three years later they had sailed so far west across the Atlantic that they had actually sighted Greenland ; in 888, or thereabouts, they reached the White Sea. And, later on, recollect, these northern types of

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ships were to go all the way down to the farthest end of the Mediterranean in connection with the operations of the Crusades.

One high authority has fixed the date of the Gogstad ship as A.D. 850, and if we care to accept that definitely we can only marvel at the excellence of design and workmanship which our northern ancestors possessed. Clinker-built, entirely of oak, caulked with cow's-hair, this craft weighs about twenty tons; she has a flat floor, her draught being only 3 ft. 7 in. She would be splendidly fast before the wind or on a broad reach, but I cannot imagine her doing anything else than making a fair wind of it. At the same time, it is only right to mention that the beiti-ass, already referred to, has been called a tacking-boom. But we know that this spar was so long that it could knock a man overboard from a boat when sailing too close past; it could hardly do that when the craft was beating to windward with the beiti-ass fore-and-aft; and the inference is that this boom was to improve the sail when running before the wind. You see the same idea in the old Dutch marine masters of the seventeenth century.

Wooden shields in a row and overlapping each other afforded protection both from the seas and the enemy's missiles. Like the Egyptian ships, they were strengthened by a girdle, called in Norse language the "vuggyrdil." There were three principal classes of shipwrights employed in the Viking shipyards, viz., the head-smith, the stem-smith, and the strake-smith. In addition to these came the blacksmiths, nail-makers, and joiners. Timber was

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both plentiful and at hand, and we can think of the pride and interest with which the workmen endowed these craft before the vessels went down the rollers into those rock-bound waters of the blue northern mists. To this day there is no finer bad-weather design than the double-ender, and whether we consider the modern Norwegian pilot-ketch or our own lifeboats, or the so-called cruiser-stern in modern warships, we must think back to that design which the Vikings in their simple genius created and handed down for our use. For these Northerners have set their influence on the whole evolution of shipping, and not even the intervening centuries have been able to wash out that influence.

CHAPTER IV

MEDIÆVAL RIGS

IN the Mediterranean, Venice had become a great trading port by the eighth century, and its ships were very busy carrying commerce between the Adriatic, the Levant, and North Africa. It was her geographical position which enabled her to rise to such political power and independence, so that presently she was to possess the carrying trade of the world.

It was the custom during centuries for Chinese goods to come by sea to Ceylon, whence the rich silks and other commodities were carried by Indian ships to the Persian Gulf, and so over land to Europe. Thus already by early mediæval times Venetian ships were able to bring home costly skins, rich silks, peacocks' tails, and purple garments from the romantic East. Now the whole story of ship evolution is just one long series of different influences working to bring about the most satisfactory rig and hull in regard to the conditions of port and sea.

By the seventh century the rise of Moslem power in the Mediterranean caused an Arabian dominion over Southern Europe, and before long the North African coast from the Nile to the Atlantic came under this sway. Indeed, during the eighth century the Arabs overran Spain and

Southern France. Now the Arabs have always been excellent sailors and navigators, and have left to us such words as "admiral" in the nautical language of the world. Later on it was the Arabs who were to teach the Spaniards and Portuguese their navigation, and this, in turn, was to bring about those wonderful overseas discoveries by Columbus and others. But in our immediate study I wish to emphasise the fact that it was these Arab sailors who introduced into the Mediterranean their eastern lateen sail, which was to remain for centuries the mizzen of the full-rigged ship. We shall refer to this again in due course, but we must never forget that here we have a sail which came from the east to the Mediterranean, spread to Northern Europe, and was one of the most useful gifts of Oriental seafarers.

Nothing develops shipping more than seafaring, and the more frequently you can induce the vessels from various countries to meet in strange ports, the more quickly will rigs be improved; for all seamen are by the nature of their avocation highly critical and always on the look-out for some improvement in gear. Now it is obvious that Venetian and Arabian craft meeting in various Mediterranean ports were bound to exercise a mutual influence on each other; but there comes another occasion in which the Mediterranean ships were both to influence and be influenced. This was the Catholic religion. How? Well, the Arabs had possessed themselves of the Holy Land, and then in 1095 a holy war was resolved upon against the infidel, and we get the Crusades beginning. By the truce with Saladin,

September 1192, pilgrims were allowed to visit Jerusalem without Moslem interference.

So here was a wonderful impetus for the ship, here was such a demand for passenger-carrying as had never before been known. Armies and horses and pilgrims from England and Venice had to be carried to the Syrian coast, and this meant a new and unprecedented amount of work for shipwrights and sailmakers, and it required every available seaman who could be found. Men who had never been outside their own village now became travellers across that boisterous sea of which they had heard such terrifying accounts. You may get some idea of this new influence if you realise that for Middle Europe the sea gates were Venice, Genoa, and Marseilles. To the Venetians, for instance, envoys came inquiring about tonnage sufficient to carry 4,500 knights, 9,000 squires, and 20,000 men-at-arms across to the Holy Land.

It was a tremendous requirement even for Venice, but it was carried out. And during the Middle Ages the intense rivalry between Venice, Genoa, and Pisa was one of the finest forms of inducement which the sailor ever had for developing his hull and rig. It was only on such occasions as the carrying of pilgrims, or in uniting against the raids of Saracen corsairs, that the Genoese and Pisans co-operated. For example, in 1087 the Pope sent ships from these two towns to dislodge the pirate chief Temin, who resided south of Tunis. The result was favourable for the Christians, for Temin was beaten and the stronghold captured. Thereupon the Pisans and Genoese stipulated for the free ad-

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mission of their merchant ships to trade with the Tunisian coast.

And before we pass to details let us mention the convoy system which prevailed in the mediæval Mediterranean. This was very essential for the protection of trade; for the French and Germans, the Lombards and the Tuscans depended on it for their silks, sugar, pepper, and other Oriental produce. Therefore, from Venice at regular intervals a convoy of merchant ships used to sail to Acre, escorted by as many as thirty or forty galleys which protected the merchantmen against those preying pirates. Whether bound for Egypt or Syria, the convoy—called a “mudia”—collected at Venice. There were only two convoys a year, one leaving Venice in the spring and arriving back home in September; and the other which left Venice in August, spent the winter abroad, and returned in the following May. In addition to these were the pilgrim convoys, and Genoa sent an annual convoy to Syria and to Egypt for the corn.

Now on a tomb in a church at Milan a Pisan artist named Balduccio in the year 1339 fortunately sculptured a merchant ship of his time, and we may regard her as typical of those traders which were used at this period by Venice, Genoa, and Pisa. We may say at once how very little had been the change in over a thousand years; for there is very close resemblance between the Roman merchant ship of A.D. 200 and this fourteenth-century craft. Balduccio's vessel is round and beamy, like that other corn-ship, with a rounded stern, but she has also a

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stern-castle and forecastle as well as a fighting top. These were essential in order to render her more able to resist the attacks of Genoese, Greek, and Arab pirates. This vessel is, in fact, half-way between the Roman cargo ship and the carack which was to develop later into the galleon. In the Pisan ship the heavy rudder is still at the side, as it was both in Egyptian times and the period when St. Paul went to sea. The rigging of the mast is set up by tackles, and the blocks are clearly indicated. There is a tiller, but the rudder itself is supported by tackles fore and aft.

The elaborate work on the stern gallery of this craft, and the influence of land architecture, show the amount of care and pride bestowed on their freighters, as distinct from the purely fighting galley. Thick rubbing strakes have been added, under which the ends of the beams come flush. The rigging is strong and substantial, three shrouds to each side. The anchor is secured to a shelf outside the hull on the starboard side, and there is shown a good thick cable. In short, we have a beamy, stout ship built not for speed but for seaworthiness, and able to carry plenty of cargo across the Mediterranean in spite of summer gales and the attacks of pirates.

Venice had its maritime law, but it was the Rhodian sea law which inspired the regulations of mediæval merchant ships. The size of these craft was reckoned not in tons, but in either modii or amphoræ. Thus it was customary to value a ship, with all her tackle, at fifty pieces of gold for every thousand modii of her capacity. Harbour dues were reckoned according to the valuation of the ship.

The passengers came on board either as pilgrims or because they were merchants travelling with their goods. They brought with them their own bed and coverings, their food, wine, cooking-utensils and firewood. They were not allowed a proper cabin, but each passenger was permitted a sleeping space three cubits long by one cubit wide. Their food consisted of biscuits, meat, vegetables, cheese, salt, garlic, onions, and vinegar. It was one of the virtues of a good pilot that he knew the coast so well as to be able to say where fresh drinking water was obtainable.

The actual representations of mediæval ships are found in contemporary seals, coins, stained glass windows, sculptures, and manuscripts, as well as mosaics, tapestries, and paintings. One result of the Norse invasions of our own country was to leave behind here the design of the Viking ship as the standard. From the Bayeux tapestries we know that the ships of William the Conqueror were of this type, with the steering-rudder at the starboard side. We see the mast and the one large square striped sail and the pavisses of shields to protect the men.

Now when Richard I resolved to send his English ships across the Bay of Biscay and up the Mediterranean on a crusade to the Holy Land, he was doing more for the development of rig and hull than he could possibly realise. Hitherto our vessels had coasted to Ireland and Scotland, or they had run across to France and Norway; but now they were to go down to the Middle Sea and observe the galleys and freighters of the southerners. These certainly did impress our forefathers, as in the case of the great

Saracen ship espied near Beirut which had three masts and carried fifteen hundred men aboard. Realise that the English were in their comparatively small, single-masted ships, and that they had great difficulty in attacking and climbing up the enemy's tall sides.

One of the effects which followed this Mediterranean visit was the introduction of both fore- and stern-castles, and thus in thirteenth-century seals we get these castellated structures built on the Viking-like hull with its high stem and stern post. Another result was that Richard brought home a roll of laws regulating maritime matters. But it was the nearness of France that, sometimes for hostile reasons, sometimes for other causes, did a great deal in developing the shipping of our country. Under John, for instance, seamen were for the first time retained for the navy with permanent pay, and the size of craft was increasing. Decks and cabins and more than one mast began to be introduced in the thirteenth century, and the fighting top as well as forecastle and stern castle had become permanent features. In short, then, a thirteenth-century English fighting ship consisted of a Viking-like hull with plenty of freeboard, with castle at bow and stern, and rudder at starboard quarter. There is one mast, well supported by rigging and backstays and forestay. The large square-sail has a yard but no boom, and this sail is stowed along the yard, men being sent aloft by the backstays to unfurl the sail. Braces are shown at each yard-arm. These ships already possessed some sort of a windlass drum for breaking out the anchor.

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We saw in a previous chapter that the Vikings were accustomed to using reef-points, and in the English ships they had certainly been used by the twelfth century. The use of the detachable "bonnet" (still employed by the Norfolk wherries of to-day) was well known among English sailors of the first part of the fourteenth century, and this custom continued in the Royal Navy right down to the eighteenth century. The Hanseatic League, from the twelfth to the sixteenth century, with its principal foreign markets of the North Sea at London, Bergen and Bruges, became an important factor in developing the multiple-masted vessel. For this great commercial association required bigger and more serviceable ships to go up the Baltic and fetch furs, wax, skins and fat from Russia, copper and iron from Sweden, and cloth from England. And in the North Sea there were pirates lying in wait for these valuable cargoes, just as we have seen the Mediterranean traders compelled to run similar risks.

But now another most important improvement had come in. By the fourteenth century the Viking type of vessel was being supplanted by a beamier, bigger-bellied type, and the rudder at last vanishes from the quarter where it had been ever since Egyptian days, and is now placed right aft at the centre where it has remained ever since. A typical trader of the late fourteenth century had just one large square-sail with powerful forestay. The hull was built for seaworthiness and carrying capacity, with raised bulwarks and strong rubbing-strakes, and big hawse-holes at the bows. The stern was square, with the

rudder at the centre. Sometimes no castle is seen at the bow ; but the warships of that time always had their castellated structures and their armour-clad warriors. It is by no means rare to find two-masted ships in the Mediterranean during the fifteenth century. Carpaccio, for example, that great Venetian artist who left behind more pictures of ships than any contemporary artist, shows a three-masted vessel which is the forerunner of those bigger craft that were to make the famous explorations during the late fifteenth and sixteenth centuries. Carpaccio's vessel is rigged on the foremast with one square-sail and topsail, with a lateen sail (thanks to Arab influence, as we have seen) on the second and third masts. This, it should be mentioned, is a warship and carries eight oars a side. But it was the introduction of cannon which was to revolutionise warship design. It demanded a vessel of high freeboard, great structural strength, and such a size that she could carry her guns in bad weather. Thus, the galley type from the fifteenth century begins to cease being the warship standard of design. Extreme mobility and reliance on oars give way to greater seaworthiness and reliance on increasing sail power. Two masts soon became three, because the hull had begun to be of greater tonnage and needed more propulsive power. But the sails would have been too big to be handled unless the plan was split up, and so three masts were absolutely essential.

We have arrived now at the stage when we get that combination of the old Egyptian square-sail being used in conjunction with the more modern lateen, triangular sail.

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Each has its own advantages and its disadvantages ; but, when used in the sea-going ship, we have in this hybrid rig an arrangement which is seamanlike. The square-sail makes not for handiness but for wholesomeness : the lateen, on the other hand, aids the steering of those awkward vessels especially on a wind. It is thus that we have a compromise which, like all other compromises, was not perfectly satisfactory, but yet was not unsuccessful. At any rate, it was the first approach to that rig which was one day to be seen in the wooden walls of Nelson and the clipper ships that were to bring home tea from China in record passages.

Commerce, crusades, the carrying of pilgrims—these three did an immense amount of good in making the ship something more than a glorified open boat. With regard to the carrying of passengers, there was a Barcelona ordinance of 1258 which compelled the shipowner to keep a supply of food on board to last fifteen days. And in England the carrying of pilgrims to Compostella was such a regular trade that Henry VI in 1434 granted a licence to carry no fewer than 2,433 pilgrims.

Until the coming of this big-ship rig of square-sail plus lateen mizzen, the world was not ready for overseas exploration, a route to the rich East Indies as opposed to the historic land journey could not be attempted, and the West Indies must still remain undiscovered. Seamanship and bigger shipbuilding had been encouraged by the more frequent trade voyages between northern and southern Europe ; the ocean had become the accepted road to wealth. But it

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needed one thing more before ever the ocean-going ship could trust herself on those long voyages : and that one thing was the compass.

Most probably it was the Chinese who had been using this since very early days. It is almost certain that they introduced it to the Arabian seamen. About the year 1190 the water-compass was being used in Europe, and probably the first time that English sailors saw it was at the period of the Crusades. So long as the Mediterranean and North European seamen coasted, the compass had not been entirely essential, but its adoption meant the opening up of the world to the ship and merchant. The Arabs had long been great navigators, for they calculated their tables of latitude and longitude by astronomical observations, and had also produced rough coastal charts. About the beginning of the fifteenth century the bigger ships of the Mediterranean were able to avail themselves of compass, astrolabe, a timepiece, and charts.

But no one did so much to get all this knowledge into one whole, to systematise the nautical arts and sciences, to spread their employment, as that wonderful man Prince Henry the Navigator, who made it his life's work to advance shipbuilding, navigation, and chart-making to such a stage as had never previously been reached. With the exception of short intervals he remained at Sagres, near Cape St. Vincent, from 1415 to 1460, directing a nautical university and superintending his shipyards at Lagos. There are few more ideal combinations than those of the seaman and student, and it was Henry's mind that was exactly suited for this

magnificent work which he accomplished. The rig of big ships had reached that stage when such a man as Henry was essential. Thus to Sagres he attracted all the maritime information which could be obtained. Geography, mathematics, cartography, navigation, facts obtained first-hand from travellers and merchants, knowledge which only Arabs and Jews then possessed in regard to astronomy, other facts which veteran pilots brought with them—everything that could be of the slightest use came to Sagres.

The result was that the three-masted ship with square-sails and lateen was able to go forth with confidence : Columbus to find the New World whilst looking for the East Indies, da Gama to reach India, Magellan to encircle the globe. And from that Sagres the enthusiasm spread to England, where navigation began to be taken up in earnest, and a new seamanhood began to be educated, which was to give such distinction to the reign of Elizabeth.

But of course the ship, with its practicable ocean rig, had to come first, and it had needed centuries of trading and fighting, many voyages in northern and southern Europe, and in all weathers, before such an arrangement of masts and yards and sails could be devised that would enable a moderate crew to take the ship conveniently into any sea. It is proof of our forefathers' accurate discernment that the full-rigged ship was to change, not so much in essentials as in details. We, who are contemporary with the dying sail-driven ocean-going vessel, know how close is the connection between those vessels of Prince Henry's time and those triumphs of design

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and build which were to receive their death sentence during the Great War. In the following chapters it will be our pleasure to note the manner in which the ideal rig was to be modified in accordance with greater experience, and those fresh demands which came to the sailing ship.

CHAPTER V

CARACKS AND CARAVELS

WE have now arrived at the stage when the single square-sail ship has become obsolete. At first, in the transition, we have, at any rate in the North European vessels, just two masts with a square-sail on each. The mainsail (which in this case is on the second mast reckoning from forward) has both bonnet and drabbler and bowlines. Thus, reef-points were not necessary, and in order to shorten canvas the unlacing could be done quite quickly. It is rather curious, incidentally, to notice how reef-points first came in quite early, as we have seen, and then passed out of fashion in favour of the bonnet and drabbler; but during the seventeenth century these reef-points, after a temporary lapse, came back into use.

There is a model in the Deutsches Museum, Munich, with its two masts, its two square-sails, its two fighting tops, raised forecastle and stern-castle, side-rudder and oars, which shows the North European ship ready to come under Mediterranean influence; and in that same museum we have a fifteenth-century Hanseatic cog-ship, which represents the North European trader, with her three masts, square foresail, larger square mainsail, but lateen sail on the mizzen. The hull has a square stern with rudder in the centre, she has both raised forecastle and stern-castle, not as superimposed

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platforms, but as much an integral part of the ship as the t'gallant foc'sle was in a nineteenth-century sailing ship.

In this cog-ship we have the blend of the old Viking mainsail with the Mediterranean fore-and-aft lateen, and so we get a little closer to that carack class which was such a feature of the fifteenth century, and had its origin in the Middle Sea. Already the point has been stressed in these chapters that the mutual influence by northern and southern shipmen is one of the most interesting facts of our story, and when we think of the increasing overseas trade which now went on, this influence was to become greater rather than less. For, just as the herring was the foundation of Dutch power, so the woollen trade was to develop the industrial power of the Flemish cities. Thus, too, the Flemish carack in its voyages to and from the south became as well known in the Mediterranean as the British liner is known to-day in the Atlantic.

The carack represents the "round ship" in its fifteenth-century development and later. It is the embodiment of that effort to create a vessel so rigged and so built that the merchants could have a reasonable hope of their woollen and other goods being carried from port to port in safety. This three-masted type had come not as a sudden inspiration, but as the result of experience—of actual seafaring. It was the absolute breaking of the galley tradition, and of the Viking class of open boat: for what was required primarily was ample cargo space. And thus there were caracks as big as six hundred tons, clumsy if you like, but with a fair wind able to get along. Some of the Portuguese fifteenth-

century caracks were even bigger still, and quite formidable fighting ships of over fifteen hundred tons, with four decks, forty guns, carrying a thousand sailors, soldiers and others. The discovery of the route to India, and to those unlimited oriental treasures was, indeed, the very greatest incentive to build as big caracks as the Portuguese naval architects and craftsmen were capable. These vessels, indeed, were the mammoths and leviathans of their time, and amazed English seamen, when after much fighting some of these vessels actually fell into their hands.

Obviously these vessels had to be armed well in those days, not merely because of professional pirates, but because of the wars and rumours of wars. For the secret of the sea route to the East remained intact a long time until English sailors captured the famous vessel which revealed that closely guarded monopoly. Trade secrets always stir up jealousy and inspire competition, and in the fifteenth and sixteenth centuries this competition, this jealousy, culminated in sea fighting, as we all know. Commercial jealousy was the foundation of the wars with Spain, as it was of the subsequent wars with Holland. And thus the arming for self-defence of these caracks was something very real and had a lot to do with the modifications of their design.

Gone were the days when the biggest ships were to rely on the methods of fighting which had come down from the times of the Mediterranean galley ; although in a modified form, and in that mongrel craft the galleass, the mobile oared galley did persist right through the sixteenth century and after, but it was unable to rival the slower and bigger-

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bodied carack type. Of course there was still a considerable prejudice against the use of guns, and the old-fashioned seamen for a long while objected. All the same, these weapons were destined to be employed afloat as they had been on land ; and because good gunnery demands a good platform, which at sea means a steady ship, it was obvious that the cargo type rather than the old fighting galley must be the man-of-war of the future. When first the freighter hull was to carry cannon, these guns were placed on the upper deck and fired over the bulwarks. Just as in the Viking craft there had been a pavisade of shields, so in those early bigger ships there was a pavisade of cloths and wood to protect both gunners and guns. The next ships to be built had a more permanent affair, in that holes were made through the bulwarks which allowed the muzzle of the gun to protrude. It is thus that there comes into nautical vocabulary the word "gunwale," or the top "wale," or plank. The word still survives in yachts and other sailing craft which never carry a gun.

But there was yet another influence which the introduction of cannon caused. Good gunnery demanded higher freeboard, and, lest the beams should be strained, considerable tumble-home was given to the ships. In fact, the width of the upper deck actually became only about one-half of the greatest beam. But this height was most advantageous, and enabled the big ship always to be superior to her enemy, the galley, except in light airs. She could, from that height of platform, fire death into the smaller but more readily handled craft.

The three ships of Columbus when he started out in 1492 on that voyage which caused the discovery of the West Indies were the caravels *Santa Maria*, the *Nina*, and *Pinta*. The word "carabela" was not then given exclusively to a particular kind of ship, but to certain vessels of medium tonnage, such as were used in trading. This *Santa Maria* had been built for the Flemish trade, while the *Nina* and *Pinta* had been built for trading in the Mediterranean. Of the flagship, *Santa Maria*, we will speak presently; it is enough to state for the moment that she was three-masted, and that one of the other two had only two masts with a lateen on each and no square-sail. Thus one of the squadron was a fore-and-aft.

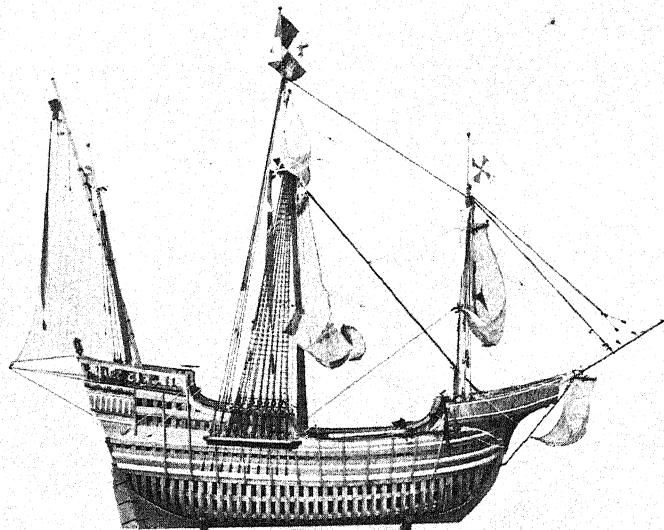
During this first voyage the *Pinta* also was rather a nuisance, as she was such a slow sailer and delayed the progress of the squadron. This happened many times, and Columbus gives the reason because the *Pinta* "sailed badly when on a bowline, the mizzen being of little use owing to the weakness of the mast." Originally, be it noted, the *Nina* had started out as a lateen-rigged craft on all masts, but when the squadron reached Grand Canary she was rigged with square-sail, the far more suitable rig for the long voyage to the westward.

As to the rig of the *Santa Maria*, we fortunately have the most detailed information, and if the reader will take the trouble of going to the South Kensington Museum he will see a most beautiful model of this craft, here reproduced, though it is not strictly accurate. As recently as the year 1923 it was presented by the Spanish Govern-

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ment to the British nation, and is a copy, most exquisitely wrought and rigged, of a model in the Madrid Naval Museum, which, in turn, was constructed from information contained in contemporary documents. Here, then, we see the very vessel in miniature such as traded between Flanders and the south, and wallowed on her way later on across the Atlantic. I use the word "wallowed" deliberately, for in 1893 an actual sea-going replica of this ship was built in Spain for the Chicago Exhibition, and she sailed across the Atlantic with a Spanish crew under Captain Concas, who reported that she pitched abominably. A British naval officer, since dead, but then in command of one of our gunboats lying half a cable's distance from the new *Santa Maria* shortly before she sailed, informed me that he could well believe every word that Captain Concas had said against this awkward ship. We can only respect Columbus the more for his great undertaking.

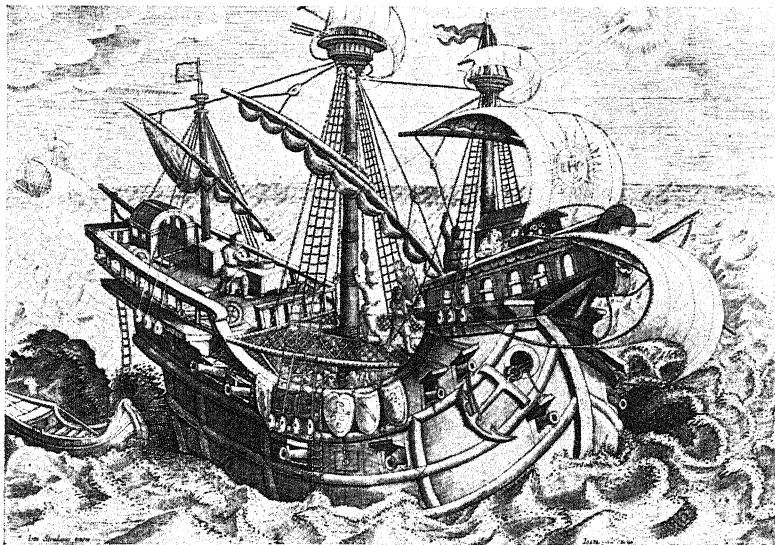
But if the great explorer found her "a dull sailer and unfit for discovery," Concas took thirty-six days to get across, his best speed being six and a half knots. In considering the rig of *Santa Maria* let us begin from forward and work aft. First of all, let it be understood that such things as triangular headsails were unthought of for a very long time, but will be considered in due sequence. The bowsprit existed not for the purpose of setting sail but for the stays of the foremast. As a kind of after-thought, a yard was set at the inboard end of the bowsprit and on this yard was bent a small square-sail in favourable weather, but actually it was not a fixture for another century.



MODEL OF *SANTA MARIA*.

Presented by the Spanish Government to the British nation. It is, however, not strictly accurate, especially in such details as fore- and stern-castles and rigging. There should be no ratlines, or bobstay, and the mainstays should be undivided.

(In Science Museum, South Kensington.)



EARLY SIXTEENTH-CENTURY WARSHIP.

Showing field guns, nettings to prevent boarding, shields, main and mizzen yards in two parts lashed together, and pilot taking an observation of the sun by compass.

From a sixteenth-century print.

(In Science Museum, South Kensington.)

CARACKS AND CARAVELS

The foremast carries one square-sail with its sheets and braces. There is a powerful mainstay, as in the old Roman corn-ships, and the mainmast carries a topsail above her square mainsail. The *Santa Maria* did not carry a fore-topsail, though some other ships of her period did. Topsails had become essential now that the size of the square-sails was so big. The mizzen-mast carries just that one lateen sail sheeted home by means of an outrigger, or "outligger," as our Tudor ancestors used to call it. In this *Santa Maria* we can still see in the forecastle a trace of the post-Viking type of ship, but the stern has become considerably raised. Her displacement has been estimated at about 200 tons, and she carried a crew of seventy. There is a most interesting reference in Columbus's own words as to the sail carried, as, for instance, on Wednesday, October 24, when he writes : "I remained thus with little wind until the afternoon, when it began to blow fresh. I set all sails in the ship, the mainsail with two bonnets, the foresail, the spritsail [that is the sail below the bowsprit just alluded to] mizzen, maintopsail, and the boat's sail on the poop."

One gets some further idea of the speed of these ships from the homeward voyage after the loss of the *Santa Maria* and the squadron had been reduced to two ; for when the *Nina* was caught in a heavy gale of wind she was compelled to snug down, but carried her mainsail " very closely reefed," and thus in three hours made twenty miles. The *Pinta* again was a source of anxiety, for she had become crank owing to the provisions and drinking water having

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been consumed. Barrels used for wine and drinking water were therefore filled with sea-water, and thus the vessel was steadied, and before a westerly wind she went along under foresail only.

Captain Concas's experience in the *Santa Maria* of 1893 had its precedent in the original ship of that name, for Columbus's craft when near Teneriffe "took in much sea over the bows." Into the loss of this historic ship we have not the space here to inquire, but we may pass to examine some other of her details, not because she was the vessel which carried Columbus across to the New World, but just for the reason that she represents a first class freighter of the period we are at present considering. Her mainmast, for instance, was $2\frac{1}{2}$ ft. in diameter, the cordage was of hemp, and the hull was roughly put together, tarred, but greased below the waterline in order to diminish skin friction. Life aboard her was not exactly a picnic, except in the sense that it was extremely uncomfortable for the crew. A couple of hatchways indicated the passage down below, but the quarter-deck extended from just abaft the mainmast to the stern, and above this rose the poop deck, where the quarters of Columbus were situated. Here were his bed draped in red, a press for his clothes, a stool, a couple of chairs, and a dining-table. His charts and books and astrolabe were there to aid him in his navigation.

The anchor was got aboard by a line from the fore-yard-arm, and steering was done by means of a tiller which came in under the quarter-deck, a bar being attached to this tiller. Thus the steersman could not see very much, and

merely had to obey orders. There were two pilots in the *Santa Maria*, who were responsible for the navigation of the ship under Columbus, and the other officers included the master, a surgeon, a quartermaster, clerk, carpenter, caulkers—a very necessary petty officer in these ships—a cooper, steward, gunner, bugler, besides the gentleman adventurers, servants, and seamen. Columbus designated himself the “admiral” of the squadron. And yet no admiral of modern times would ever have put to sea under the conditions which this most gallant pioneer started out. “I departed,” he wrote, “in the name of the Holy Trinity, on Easter night, with the ships rotten, worm-eaten, and full of holes . . . and in this condition I had to cross 7,000 miles of sea.” That was on his fourth voyage.

When one thinks of Columbus’s indifferent ships, not specially built for exploration, but just selected from the freighters of the time, sailing out into the unknown with inadequate charts and indifferent navigational instruments, one’s admiration for his pioneer bravery reaches its maximum attainment: surely here we have the gallant seaman, the intrepid mariner at his best, drawing back, so to speak, the mists of ignorance for posterity to behold and enjoy the land across the ocean. There is always something difficult in an undertaking which has never been attempted before, always a very special kind of courage needed for an enterprise which may end in colossal and complete disaster. But words are inadequate to describe the enterprising determination of this historic leader in his tremendous adventure.

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When one thinks of Columbus’s indifferent ships, not specially built for exploration, but just selected from the freighters of the time, sailing out into the unknown with inadequate charts and indifferent navigational instruments, one’s admiration for his pioneer bravery reaches its maximum attainment: surely here we have the gallant seaman, the intrepid mariner at his best, drawing back, so to speak, the mists of ignorance for posterity to behold and enjoy the land across the ocean. There is always something difficult in an undertaking which has never been attempted before, always a very special kind of courage needed for an enterprise which may end in colossal and complete disaster. But words are inadequate to describe the enterprising determination of this historic leader in his tremendous adventure.

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And yet, like his ships, he was just ordinary : he had used the sea for years, he had been through gales of wind, he had learnt those great lessons which the land is never able to teach. In the waters of the Mediterranean he had sailed in the clumsy caracks, across the Bay of Biscay and away north he had dared to venture even to Iceland. But it was not merely these slow, big-bellied craft that he was familiar with : away back in 1470 he had been wrecked during a seafight with some Venetian galleys off the coast of Portugal, and subsequently settled down at Lisbon. You will find that in the history of exploration, discovery is not like some conjuring trick, a sudden startling event, quick and flashing, but a gradual procedure, the culmination of long effort like the scientist's efforts in the laboratory. The Portuguese devoted sixty years of methodical exploration—one expedition following the other—until at last Vasco da Gama was able to get round the south of Africa into the open sea. These crazy craft, such as we are considering, felt their way piecemeal by successive expeditions, every voyage checking the previous ones and adding a little more information to be worked on and discussed before the next expedition set forth. It was in this manner that da Gama's great achievement was brought about—from the Senegal to the Gambia, from the Gambia to the Congo, from the Congo to the Cape ; and then at last the great adventure into the unknown which ended at Calicut.

So it was with Columbus. He had made many a voyage, not merely through the Mediterranean but to

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Madeira and the Azores, and gradually there arose in his mind the instinct that India could be reached by sailing westward. This conviction was in his mind by 1474, long before da Gama had found that way by going to the eastward. So far as Columbus was concerned, his new waters began only after leaving the Canaries, and between September 6 and October 12 he was out of sight of land, worried by many things, but with a crew of pessimists who took some handling.

These caravels, however, did prove that the Atlantic could be overcome by the pluck and ingenuity of man, and that, by a mere relation of sails and spars to hull, ships could be made to do what seemed impossible voyages. With the symbol of the cross on their sails, the flag of Ferdinand and Isabella flying above them, with faith in his ships and his enterprise, Columbus did an immense amount to prove the reliability of the fifteenth-century rig. The actual derivation of the word "caravel" is uncertain. Some authorities consider its derivation from "Carabos," meaning a species of lobster, but a more likely possibility is from the two words "cara bella," signifying a beautiful shape. At any rate, it is from this class of vessel that the galleon was to spring presently.

Such a Flemish freighter as the *Santa Maria* had strong rubbing strakes, a mainstay leading to the stemhead, a round top at the mainmast, and very substantial rigging to support that mast. A Flemish carack of about the same period we know to have been a three-master with lateen mizzen, square mainsail, and square-sail on the foremast; and

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fighting tops, round in shape, are shown in each mast. The parrels for the mainyard we definitely know were still retained, and one of the most striking features is the rigging of the mainmast with its deadeyes and lanyards and main chains. Other important characteristics were the great hawse-hole for the cable for'ard, the strong rubbing strakes on the side of the hull, and the six-armed grapnel at the extremity of the bowsprit, this contrivance being at the end of a chain ready to be dropped on to an enemy ship before boarding tactics commenced.

As one examines contemporary pictures of such craft, or reconstructed models based on contemporary documents, the wonder to us moderns is that these caravels and caracks could ever make the voyage in safety which we know they performed on many occasions. But all the while we must remind ourselves that in those days time was not of that value which it possesses to-day; and if the trade winds were not to be used, then, in such waters as the Narrow Seas, the freighters could wait till at last a fair slant arrived and they could leave for their destination. Safety first, not speed, was the motive at the back of these officers; for in those leaky hulls merchandise was liable to suffer damage in any case. But, if the goods could be taken across the sea without falling into the hands of rovers or political enemies, the merchant was pleased and the ship-owner was not less satisfied. Record passages, such as came in with the tea-clippers centuries afterwards, were undreamt of. The mind of civilisation had not developed thus far. It was sufficient that, out of the generations of

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experience gained by Mediterranean and northern sailors, there had at last been evolved a three-masted vessel which could go anywhere, carry a maximum of cargo, be well armed for fights against swift-darting galleys and other craft, and at last come safely back to the land whence she had set out. It was a great achievement, because it was to dominate the whole trend of the world's history.

CHAPTER VI

TUDOR SHIPS

THE carack, then, with her great depth of hold for cargo and her comparatively good seaworthy qualities, standardised the three-masted ship rig, so that during the sixteenth century the changes which took place in her are not so much in principle as in details. The round stern of the mediæval ship gives place to a square tuck, and the stern-castle becomes narrower but loftier and projects aft till it considerably overhangs the rudder.

Similarly, the sail plan becomes modified so that the mainsail is smaller, the foresail is bigger, and likewise the topsails. It was a still further effort to standardise the spars so that the spare ones which were carried might be adaptable in the case of the numerous accidents which happened to these vessels during some of their voyages. Topsails, instead of being rare, eventually were seen on the fore, main, and mizzen masts of Tudor ships. The bowsprit was used not merely for setting up the forestays and fore-topmast stays, but for setting up the bowlines.

Four-masted vessels were among the ships of our Henry VIII's Navy, as we know from the roll of Anthony Anthony. Square-rigged, with lower course and topsail on the fore and mainmasts, they were lateen rigged on the other two. The sprit-sail is also shown below the beak, thus when not

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in use this sail was furled and is shown stowed fore and aft. Even if the contemporary pictures of Henry VIII's ships are a little crude and exaggerated, it is still possible to see the trend of development midway between the old-fashioned mediæval carack and those more capable vessels which fought against the Armada. The beak, just mentioned, was a characteristic feature now in these great ships, and remained for generation after generation subject to modification. It was different both as to design and intention from the old galley beak, being high above the water. The greater reliance that was being placed on artillery, with its increasing range, was destined to take away the importance of the castles forward and aft: yet there was extreme reluctance to abolish the idea of boarding tactics, so it was impossible to think of discarding these raised structures. They had, however, become consolidated in the hull as part of the design long since.

Very noticeable are the crowsfeet attachments in the rigging of the Tudor ships. To-day they survive in those deck awnings seen spread over men-of-war and yachts. The object of this crowsfeet arrangement is of course merely to extend the strain, and the idea was extraordinarily popular in the rigging of the sixteenth-century ships, such as for instance in spreading the strain of the foretopmast stay, but there are many other examples too. The sails themselves were literally wind-bags; that is to say, they were of such a cut that they well kept the wind in them. This would not suit a modern yacht or coaster which spends much of her time tacking; but we must remember that

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Elizabethan ships usually relied on a fair wind, and this fulsome sail pattern would not be unsuitable with the breeze on the quarter or right aft.

And whilst we are on this subject let us refer to that passage of Essex in writing to Cecil, July 1597, where he says: "The wind is now W. by S., so as we stand close by the wind and the water is smooth, we make our way good S. at the least." The inference is that in rough water an Elizabethan ship would go no nearer the wind than seven points, and this is borne out by other contemporary evidence. Mainwayring has left it on record for us that "a cross-sail ship in a sea cannot make her way nearer than 6 points unless there be tide or current which doth set to windward." But we know from actual voyages that seven points were just as close as these wind-bagged ships could effectively proceed. They were content to wait not merely days but weeks for a fair wind, and I have before me the dates of two ships which even as late as 1719, bound across the Bay of Biscay, waited three whole months in Plymouth Sound, notwithstanding that it was important for this expedition to get away as early as possible. The fact is that it was a heart-breaking job trying to get such ships to windward, and, unless they were compelled by some special reason, our ancestors did not try.

For the purpose of reefing, the drabbler, and above that the bonnet, could be unlaced and removed by means of loops and eyelet-holes. At the end of the bowsprit and also of the lower yard-arms were sharp shear-hooks which were for the purpose of cutting away the enemy's rigging

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when ship and ship were near enough to each other. For, in spite of the introduction of ordnance, the mediæval ideas of fighting died but slowly. The inventory of the English ship *Sovereign*, dated January 1497, about to make a voyage to the Levant, included, besides her numerous guns, 200 "bows of yew," 800 sheaves of arrows, and 80 spears. Henry VIII caused to be compiled a book of orders to be used in his Navy, and herein each captain was instructed to use the following tactics.

"In case you board your enemy, enter not till you see the smoke gone, and then shoot off all your pieces, your port-pieces, the piece of hail-shot, [your] cross-bow shot to beat his cage decks, and if you see his deck well rid, then enter with your best men, but first win his top in any wise if it be possible." By "boarding" was meant the bringing of the ship till she touched the other. Thus the best boarding tactics consisted in boarding "athwart her hawse," so that the whole of your ordnance on one side could rake the enemy whilst she could use only her chase and prow pieces.

In the trading carack there were tilt-frames for the awnings, but in the sixteenth century these had become solid structures with permanent roofs. The most obvious characteristic, in fact, of these Tudor ships to our eyes is the amazing loftiness which they possessed. But our forefathers knew what they were about, and Sir Richard Hawkins summed the matter up very neatly. He said that the point was "much canvassed amongst carpenters and sea captains, diversely maintained but yet undetermined:

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that is whether the race or lofty built ship be best for the merchant and those which employ themselves in trading. I am of opinion that the race ship is most convenient, yet so as that every perfect ship ought to have two decks, for the better strengthening of her, the better succouring of her people, the better preserving of her merchandise and victual, and for her greater safety from sea and storm."

He then adds: "But for the prince's ships, and such as are employed continually in the wars, to be built lofty I hold very necessary for many reasons." And these reasons include: "First for majesty and terror of the enemy," "for harbouring of many men," "more artillery," for carrying higher masts and more sail. Smith, in his well-known *Accidence*, says that a 400-ton ship was given 4-inch planking, a 300-ton ship 3-inch planking, small ships 2-inch, and this was the thinnest planking used. Smith was writing in 1626, but it was sufficiently near to the Tudor time and there were enough Elizabethan ships and customs alive to make his information convenient for our present purpose; and some of his expressions are still vivid even in the twentieth century, that has seen practically the death of the big sailing ship.

With real pleasure we read of such things as the "boule spret," the "spret sayle," the "davids," the "cats head," the "boy rope," and the "guest rope." The "greatest in every ship is called the sheet Anchor," he tells us. And then he gives in a few dramatic passages a real insight into the seamanship of his time which helps us to visualise the life on board these fascinating vessels. "A sayle,"

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he writes for the instruction of young seamen, " how stands she, to windward or leyward, set him by the Compasse, he stands right a-head ; or on the weather bow, or ley bow : out with all your sayles, a stydy man to the helme, sit close to keep her stydie. Give chase or fetch him up, he holds his owne, nowe (we) gather on him, out goeth his flag and pendance or streams, also his Colours, his waist-clothes and top armings, he furles and slings his maine saile, in goes his spret sayle and misen, he makes ready his close fights, fore and after. Well, we shall reach him by and bye."

But now bad weather is coming on.

" It overcasts, we shall have winde, sattle your top sailes, take in the spret sayle, in with your topsayles, lower your maine sayles, tallow under the parrels, in with your maine sayle, lower the fore sayle. The sayle is split, brade up close all your sayles, lash sure the Ordinances, strike your top masts to the cap, make them sure with your sheepes feete. A storme, hull, lash sure the helme a ley, lye to try out drift. . . . Faire weather, set your fore sayle. Out with all your sailes, get your Larboard tackes aboard, hawle off your Starboard sheats."

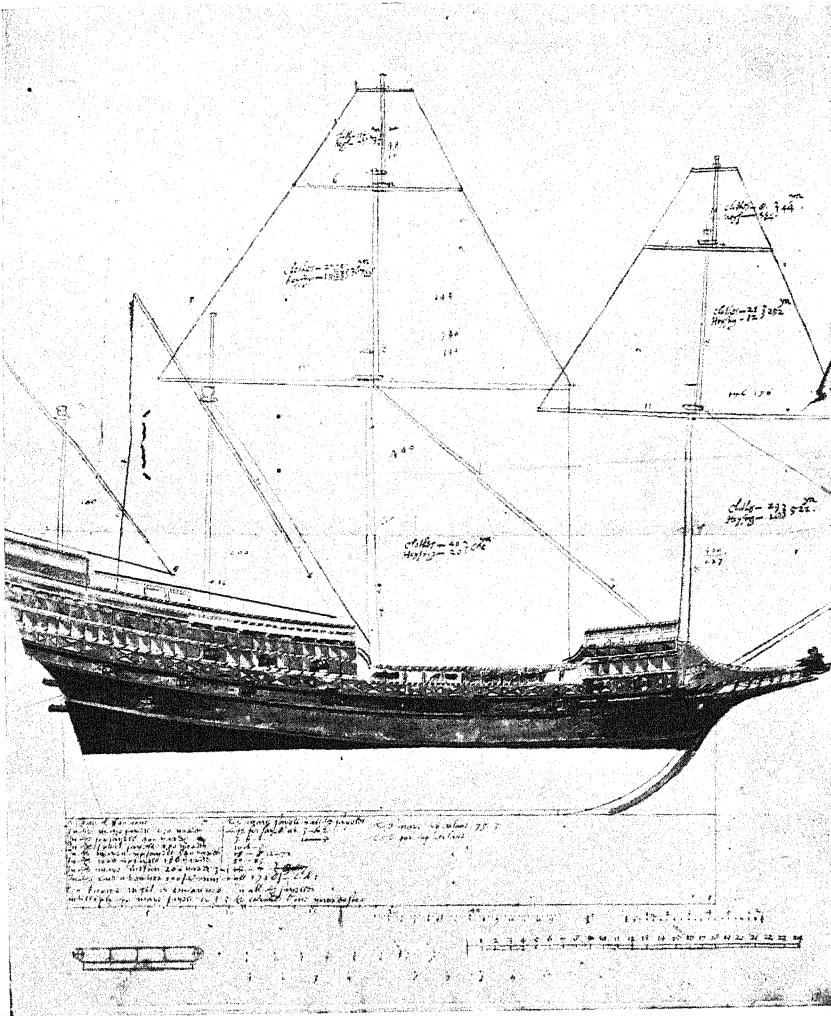
The *Henry Grâce à Dieu*, or *Great Harry*, launched in 1514, was a vessel of more than a thousand tons burthen, and carried 700 mariners, soldiers, and gunners for her thirty-four cannon. She was in her time the finest expression of a man-of-war, and her launching was an historic event in the presence of the Court, ambassadors, nobles, and bishops. Four-masted, two-decked, with t'gallant

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sails on fore, main, and mizzen-masts, and a topsail on the bonaventure mizzen-mast, she was calculated to inspire terror into any enemy. Such ships, as we know from contemporary documents, were most gaily painted with the colours and devices of the admiral, brilliant with banners and shields, and even her sails were painted with the picture of a saint.

For the strengthening of his Navy Henry VIII bought ships from those two great sea powers the Venetians and the Hanseatic League. His crews wore the Tudor white and green colours—cloth for the men and satin or damask for the officers. But it is in the reign of Elizabeth that we see the ocean-going ship at last becoming less a freak than a scientific creature with sensible rigging and original ideas. It was, however, the royal ships which were the best of all both in war and efficiency and in construction, whether built specially or bought from private owners. As an instance of the latter there was that famous ship the *Ark Ralegh*, which Elizabeth bought from Sir Walter Ralegh for £5,000 and renamed the *Ark Royal*. Of this vessel Howard wrote to Burghley a few months before the coming of the Armada: “I pray you tell her Majesty from me that her money was well given for the *Ark Ralegh*, for I think her the odd ship in the world for all conditions; and truly I think there can no great ship make me change and go out of her. We can see no sail, great nor small, but how far soever they be off, we fetch them and speak with them.”

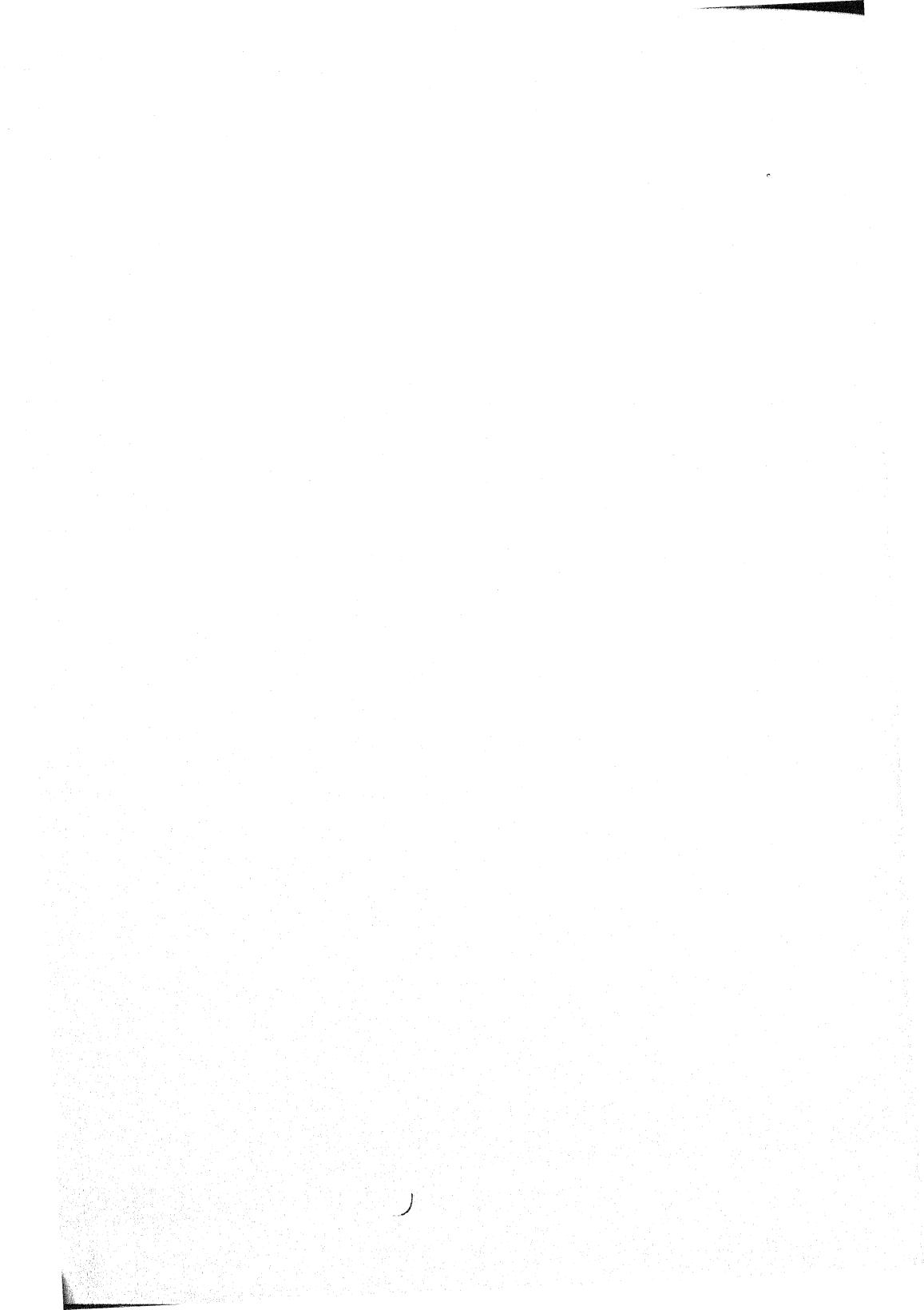
Now, fortunately, a contemporary print of this *Ark*



ELIZABETHAN SHIP.

This may represent the *Ak Royal*, or possibly the *Elizabeth Jonas*, as the dimensions of the spars correspond with those of the latter.

Taken from a photograph in Science Museum, South Kensington, of Sir Anthony Deane's *Fragments of Ancient Shipwrightery* in the Pepysian Library, Magdalene College, Cambridge. Formerly in the possession of Samuel Pepys.



TUDOR SHIPS

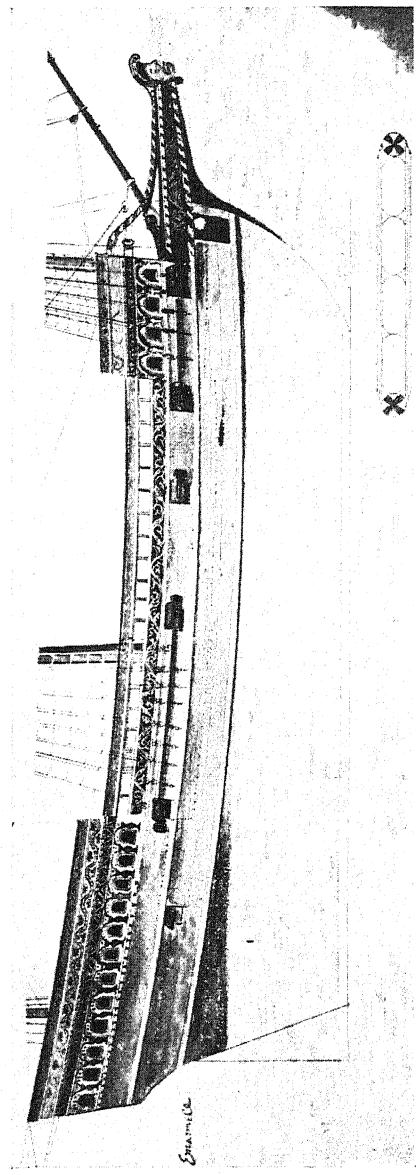
Royal still exists, so if we stop a moment to consider her, we are able to get an accurate idea of what a crack Elizabethan ship at the time of the Armada looked like. But before doing so we must clear the ground by saying that it was the queen's ships and not those mercantile auxiliaries which beat the Armada. Those of us who still remember the inaccurate history-books of our school-days know what emphasis was laid upon the fact that out of Brixham and elsewhere these gallant seamen came with their small craft. The emphasis of their actual fighting value has, however, been wrongly placed, enthusiastic and brave though these men were. Nautical research is of quite recent date, but gradually it is dispelling historical heresies, and this matter of the auxiliaries against the Armada is one of them. Thus Wynter in writing to Walsyngham on August 1, 1588, says : "I dare assure your Honour if you had seen that which I have seen, of the simple service that hath been done by the merchant and coast ships, you would have said that we had been little holpen by them, otherwise than that they did make a show."

We venerate the *Ark Royal*, then, not as a typical but as THE ship of Elizabeth's navy, and as having been the flagship of the English fleet against the Armada. Built as recently as 1587, no wonder Howard was so proud of her. She was sold whilst still on the stocks, and was of 800 tons. It is a matter for congratulation that we still have her inventory as compiled in that self-same summer of 1588 when she had come in for survey after the famous victory.

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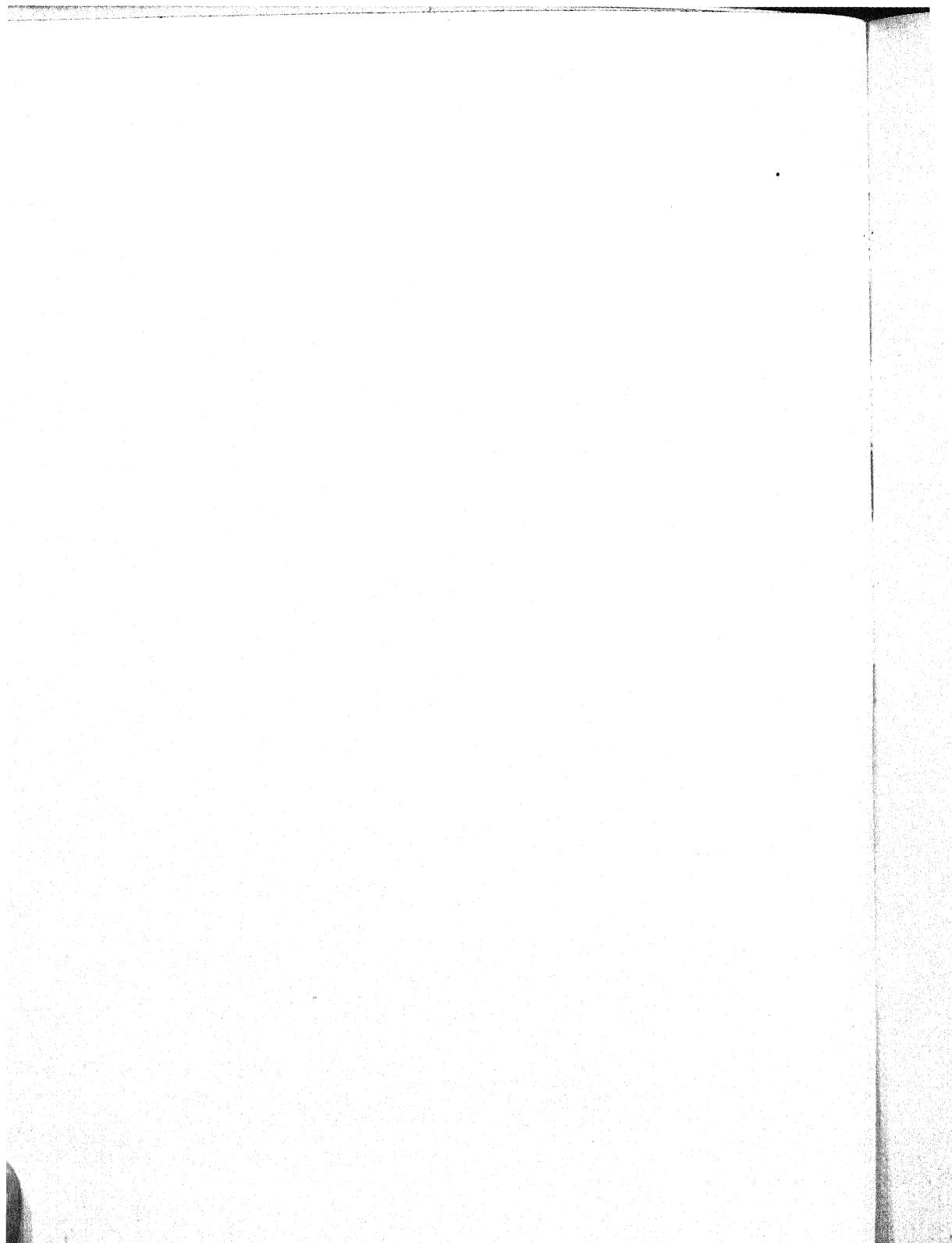
She was four-masted—that is to say, she had foremast, mainmast, mizzen, and bonaventure-mizzen. (“In great ships,” says Smith in his *Accidence*, “they have two misens, the latter is called the *boneaventuer* misen.”) The sprit-sail is shown stowed fore-and-aft on the beak, furled to its yard, this square sail having its clew-lines, sheets, braces, halyards, and a “false tye.” The “ties” were four-strand ropes by which the yards were hung, but the sprit-sail yard had no ties and was secured by a pair of slings. The foremast was still stepped very far forward and the bowsprit steeved at a great angle. This foremast had its swifters with falls and pennants “to succour the shrowdes.” The foretopsail had its forebowlines, clew-garnets, martnets (or leach-lines). The yards were hoisted by jeers or hal-yards. Thus Smith says that “a jeare capsterne is only in great ships to hoyse their sayles.” The jeers in the case of great ships were two, one on either side of the ties, and besides being used for hoisting, they were serviceable in supporting the yard in case the ties should carry away.

On both the fore and main masts the *Ark Royal* was entirely square-rigged with topsails and t’gallants: such was the progress now reached in great ships. But on the mizzen there was a lateen sail with topsail and t’gallant; and on the bonaventure there was a lateen with topsail. Fighting tops are shown on all four masts. The shrouds of this ship were very powerful. The stern is square with the poop deck overhanging, and the out-licker or “out-riiger” coming out farther still for the bonaventure mizzen sail. The foresail and mainsail each had a double bonnet



ELIZABETHAN SHIP.

This represents a vessel of about 170 tons, carrying 12 guns. From a photograph in Science Museum, South Kensington, of Sir Anthony Deane's *Pieces of Ancient Shipwrecks* in the Pepysian Library, Magdalene College, Cambridge.



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with a single drabbler. Sails were still furled in a clumsy fashion and the bunt secured to the yard by rope yarns which were cut loose when getting under way. Hence in Elizabethan nautical correspondence one finds the expression, "being in the Downs, ready to cut sail."

There were main, maintopsail, t'gallantsail, fore, foretopsail, mizzen, and spritsail halyards. There were also in these Elizabethan ships a capstan with bars for breaking out the anchor, ringbolts, rudder ropes, main bowline and mainbowline bridles, main topsail bowline, buntlines, "leatch lines," and so on. When the cables broke they were afterwards spliced, but "when that way unserviceable, they serve for Junkes, fenders and braded plackets for brests of defence." Studding-sails were already in use by the end of the sixteenth century, and the helmsman was told to "keepe your loufe, come no neere, keepe full, stidy, so you goe well, port warre, no more; beare up the helme, goe roumy, be yare at the helme, a fresh man at the helme."

Quarter galleries were seen in great ships, and the long tiller came into the ship through a hole underneath at the stern. This tiller was moved by means of a bar or whipstaff which the steersman held. It was the duty of the master and his mate to "direct the course, commaund all the Saylors, for steering, trimming, and sayling the Ship," but "the Pilot when they make land, doth take the charge of the Ship till he bring her to Harbour."

There is in existence a contemporary print of an Elizabethan man-of-war which, four-masted as she is, carries no t'gallant sails on the fore and main, and no topsails on

the mizzen and bonaventure. When running before the wind, or with the wind on the quarter, the mizzen lateen yard was often unparalleled from the mast, and the sail placed on the lee quarter, guys being fitted for steadyng purpose. If the ship was too hard-mouthed, the mizzen was stowed. These royal ships, with their Tudor green, their simple decorations, their thick shrouds and stays, their masts of fir or pine, comprised thirty-four of the 197 vessels which operated against the Armada. At least seven of this great English fleet were of a size between 1,100 and 600 tons.

And this leads one to refer to the galleon, which in England denoted a ship expressly built for the purpose of war, rather than a converted merchantman. Henry VIII had adopted this type long before Spain. The galleon was low in the waist, with a high quarter-deck which began to rise immediately abaft the mainmast and continued to a lofty poop. She was in length three times the measurement of her beam, and was destined to be the prototype of the ship-of-the-line, just as the galleass was the predecessor of the frigate, and the pinnesse the forerunner of the sloop, or corvette.

Galleys still continued to be popular in the Mediterranean, and fought at the battle of Lepanto in 1571. Such craft carried a foremast and mainmast, with one lateen sail on each; but they also carried a vast number of oarsmen, about half a dozen to each oar, and twenty-seven oars each side. Cannon were mounted forward—as many as five being shown; but these craft relied principally on

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ramming with their long, snipe-like, powerful beaks. Such craft were about 165 feet long, and there was a gangway running down the centre. The Elizabethan galleons had determined fights with Spanish galleys on more than one occasion, but the English pride in their own bigger craft, and their contempt for the enemy's much more mobile vessels, is well illustrated by two passages in correspondence during the year preceding the coming of the Armada. Thus Drake, in writing to Walsyngham of the incident off Cadiz, says: "We were both oftentimes fought withal by twelve of the King's galleys, of whom we sunk two, and always repulsed the rest." Fenner, writing also to Walsyngham, shows that he was not in the least perturbed by these mosquito craft. "I assure your Honour," he affirms, "there is no account to be made of his galleys. Twelve of her Majesty's ships will not make account of all his galleys in Spain, Portugal, and all his dominions within the Straits, although there are 150 in number. If it be to their advantage in a calm, we have made such trial of their fights that we perfectly see into the depth thereof."

Thus, thanks to the carack freighter, but subsequently to the wonderful new impetus which the English seamen now felt in regard to the sea, there had evolved a wholesome galleon which was no longer a monstrosity with exaggerated forecastles and poops, but "lower-charged," proportionately longer, and comparatively handy. Hawkins, who became Treasurer of the Navy, was largely responsible for the improved character of these royal ships, and it

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was his own idea that elm boards should be used for sheathing the underbody of these vessels, layers of tar and hair being placed in between. But there is so much of interest in these sixteenth-century craft that we shall have to consider them in a further chapter.

CHAPTER VII

AT SEA IN THE SIXTEENTH CENTURY

THE Elizabethan period, to us who are contemporary with the age of steam, always seems so resplendent, so full of glamour and hope, that it is well to note how, as late as 1587, our ancestors allowed themselves to get despondent in regard to maritime matters. Thus that great sailor Captain John Hawkins writes to Sir Francis Walsyngham: "neither need I to rehearse how dead and uncertain our traffics be; most men in poverty and discontented, and especially the poorer sort; our navigation not set on work; but the French and Scots eat us up, and grow in wealth and freights, and not assured to us in friendship."

And yet three months later Drake was writing to say that: "There hath happened between the Spaniards, Portingals, and ourselves divers combats, in the which it hath pleased God that we have taken forts, ships, barks, carvels, and divers other vessels more than a hundred, most laden, some with oars for galleys, planks and timber for ships and pinnaces, hoops and pipe-staves for cask, with many other provisions for this great army." Fenner also wrote to the same effect.

It is indeed from the correspondence of Elizabethans we find so many items that illuminate sixteenth-century

seafaring, and by this means the ships themselves become to us, not mere studies in archaeology, but real, concrete objects handled by men and driven by the wind. For example, there is that interesting epistle, also to Walsingham, sent by Howard, who was to achieve lasting fame as Commander-in-Chief of the English fleet against the Armada. The point had been raised by Elizabeth herself that Howard's fleet should not go south to await the Spanish fleet off Vigo, but she preferred that her fleet should "ply up and down in some indifferent place between the coast of Spain and this realm." To this Howard replied that "as by your directions to lie off and on betwixt England and Spain, the South-west wind that shall bring them to Scotland or Ireland, shall put us to leeward . . . and when they shall come with the south-westerly wind, which must serve them if they go for Ireland or Scotland, though we may be as high as Cape Clear, yet shall we not be able to go to them as long as the wind shall be westerly." It is another instance of the old ships avoiding beating to windward.

The rivalry between England and Spain, then, was one of the greatest motives that ever influenced the development of northern shipping, seamanship, and navigation. And it cannot be too much emphasised that the country needed both this impetus and inspiration; for those who had accepted the call of the sea by the first half of the sixteenth century were comparatively few in numbers. But now a ship connoted a kind of magic door through which the wealth of the world and the secret places of the universe might be found, as in a marvellous cavern. The

sea thus ceased merely to be a source of terror: it was to be something much more romantic than had ever been contemplated.

And just as Charles V had founded a navigation lectureship at Seville, so Henry VIII had founded guilds at Deptford-on-Thames, Kingston-on-Hull, and Newcastle-on-Tyne for the same purpose. Edward VI, too, had done his part in selecting Sebastian Cabot to be Grand Pilot of England. Little books on seamanship and gunnery began to be written, and those who had served only in coasters and fishing vessels went roving across the ocean, certain of adventure, hopeful of bringing home ample material reward for their efforts. And then, on their return to their own village, such thrilling tales would be told, such valuable spoil displayed, that the other lads and men were eager to go forth in the next expedition. Such incidents as the fights with Spanish treasure-ships, the capture of the great *San Felipe*, the coming of the Armada, Drake's voyage round the world, remained prominent in the national mind. The sea called loudly to ardent men, the carpenters were compelled to build more able ships, the riggers were told in what respects they must make their own job more efficient for open sea work, the gunners learned more than they had ever known, the officers responsible for navigation—the "pilots," as they were called—were able to draw on the body of knowledge which their instructors and older pilots had been accumulating.

Coastal navigation was no longer the highest achievement of the best pilots. To be able to know the "altitude"

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(that is, the latitude) of the ship on the ocean was essential. The pilot was no longer the "loadsman," or leadsman; he must be able to use the astrolabe for finding the altitude of sun and stars (such as had been used by Columbus, Vasco da Gama, and others). Presently the cross-staff was used by Elizabethan pilots for the same purpose, but the seventeenth-century log-line had still to come, and it was impossible as yet to ascertain a ship's longitude accurately.

And if we desire to conjure up a mental picture of these Elizabethan ships getting under way we can see the master and his mates going about busily ordering the sailors. The sailors were "the antient men for hoysing the sailes, getting the tackes aboard, hawling the Bow-lines, and steering the ship." They were the veterans of the sea, who were literally the *deck-hands*. But for the work aloft were employed yonkers. "The Younkers are the young men called Fore-mast men, to take in the Topsayles, or Top and yeard; Furle, and Sling the maine Saile; Bousing or Trysing; and take their turne at Helme." So we can watch them getting the "sailes to the yeards," while the sailors "bring your Cable to the Capsterne." The anchor was broken out, topsails set, then "let fall your fore sayle," the cable coiled "in small slakes," the anchor catted, made fast with "your shanke painter," and the ship's boat stowed. Then came the order "Let falle your maine saile, on with your bonnet and drablers," and the helmsman was told to steer a steady course as the ship runs before the wind.

And now the wind veers, so the starboard tacks are got abroad. Presently the wind falls light, and the order comes from the master, "Get your tacks close aboard." But presently it blows so hard that she "spounes" before the wind, and after a while the gale is of such force that she has to "lie at hull," i.e. heave to, or "lie to try out drift," i.e. lie to a drift-sail or sea-anchor. If the ship "lusts" and "lyes under the Sea," then "trie her with the crose jacke, bowse it up with the outlooker." And so, now that the land-pilot has come off duty, the ship, with her three or four masts, goes on her way across the open sea. The "boteswaine" has been occupying himself with the ropes and cordage, overhauling the rigging, and doing any sailmaker's job, while his mate has, after seeing to the anchor work, been attending to the long-boat, of which he is in charge. It will be the boatswain whose voice will be heard, with its delightful west-country accent, to-morrow morning calling the men to prayers and breakfast. The quartermasters have seen that the hatches are put back over the hold, but they may have some strenuous work presently if the stowage is not quite correct and the ship needs a little trimming.

Meanwhile the cook is engaged preparing the victuals with his assortment of cans, platters, spoons. But the victuals have been dealt out by the steward according to the captain's directions, each mess consisting of from four to six men. As soon as the ship had got clear of Dartmouth, or Plymouth Sound, the captain had called up the ship's company and divided it into two watches,

THE SHIP UNDER SAIL

starboard and larboard, according as the men were chosen. It was the master who chose first, and the master's mate second. Then each man chose his "comrade." The captain himself was not necessarily a seaman, but was the ruler of the ship, who instructed the master as to what port he wished the ship to proceed, or to what "height," or latitude. In the case of a fight, the captain took supreme charge, and the master was responsible for the handling of the ship and trimming of the sails.

In the steerage room was the whipstaff (already mentioned in the last chapter) for controlling the tiller; and here, too, were the traverse board, the compass and lantern. On this traverse board were marked the various courses steered during the watch. Already in these days, they spoke of a ship being "crank-sided," said that she was "iron-sick" or "spewes her okum." When the ship was riding at anchor among a fleet of other craft it was customary to peak the yards.

The upper deck was made of spruce deal, two inches in thickness. There was considerable trouble with the planking of the hull, especially in hot countries, owing to worm. Hawkins, for example, mentions how that on arriving in Brazil they found the ship's hull below water "covered with these worms, as big as the little finger of a man. . . . In little time, if the ship be not sheathed, they put all in hazard; for they enter in no bigger than a small Spanish needle . . . yea, I have seen many ships so eaten, that the most of their planks under water have been like honey-combs, and especially those betwixt wind and

water. If they had not been sheathed, it had been impossible that they could have swum."

Various methods of sheathing the hull were employed at this time, such as the use of double planks, canvas, burnt planks; but the Spanish and Portuguese ships were often sheathed with lead. This had the disadvantage of being both weighty and costly. But the most approved method in English ships was the use of half-inch elm boards, tar "half a finger thick" being first smeared on the inner side of the board, and then "another half finger thick of hair"; after which the sheathing board was nailed on to the hull. Richard Hawkins claimed that this was the invention of his father, and believed that when the worm passed through the outer board "the hair and the tar so involve him that he is choked therewith."

In the sea services of to-day there are customs and unwritten rules whose origin goes back into the dim past. But even before Elizabeth's time, right as early as the reign of her father, no captain was permitted to "take the wind of his admiral, but come under his lee." Nor was a captain to allow his "ship ride in another's wake, for in that is great danger." And whenever the admiral wished his squadron to anchor or get under way, the flagship fired a gun to inform the other ships. The discipline of the men was necessarily strict, for into those Tudor ships went some of the toughest jail-birds that ever saw the sea; and we know from the accounts of many voyages how prone the ship's company was to mutiny. It was Henry VIII who had caused to be issued a very

THE SHIP UNDER SAIL

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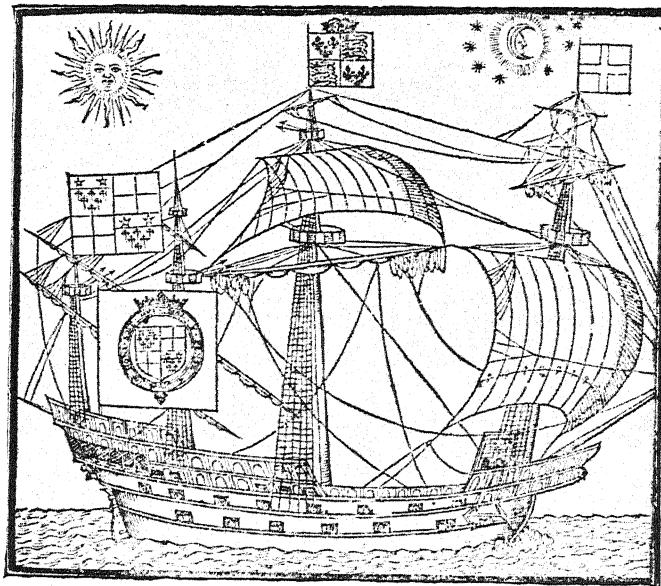
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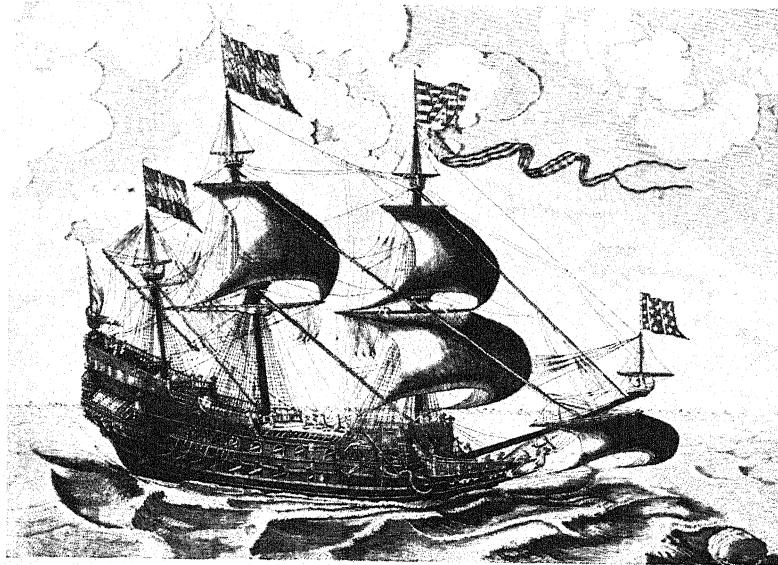
stringent order regarding the crime of being asleep when the man should have been on watch. Thus, for the first offence, he was to be "headed at the main mast with a bucket of water poured on his head. The second time he shall be armed, his hands haled up by a rope, and ii buckets of water poured into his sleeves." For the third offence he was to be bound to the mainmast with certain gun-chambers tied to his arms, and as much pain to his body "as the captain will." But the fourth occurrence of such a crime was fatal: for, should the man be found asleep again, he was to be suspended in a basket at the bowsprit end with a can of beer, a loaf of bread, and a sharp knife. That was all that ever would be done for him in this world, since he would remain there either till he starved to death or cut himself adrift into the sea.

Each and every voyage added something to the growing knowledge of seafaring. And those who were masters of trading expeditions were ordered not merely to make notes and daily entries of their navigations, but to see that the young mariners and apprentices were made to learn this. When we consider some of the experiences which these sixteenth-century seamen had to endure in those clumsy vessels we cannot cease to admire their courage and pertinacity in undergoing those Atlantic voyages. Instances are numerous, but let us remind ourselves of that Elizabethan ship which was caught one September in really heavy weather, and compelled to heave to. The seas sported with her, tumbled over her, licked her as if she were some obstructing rock. Then the rudder broke and was



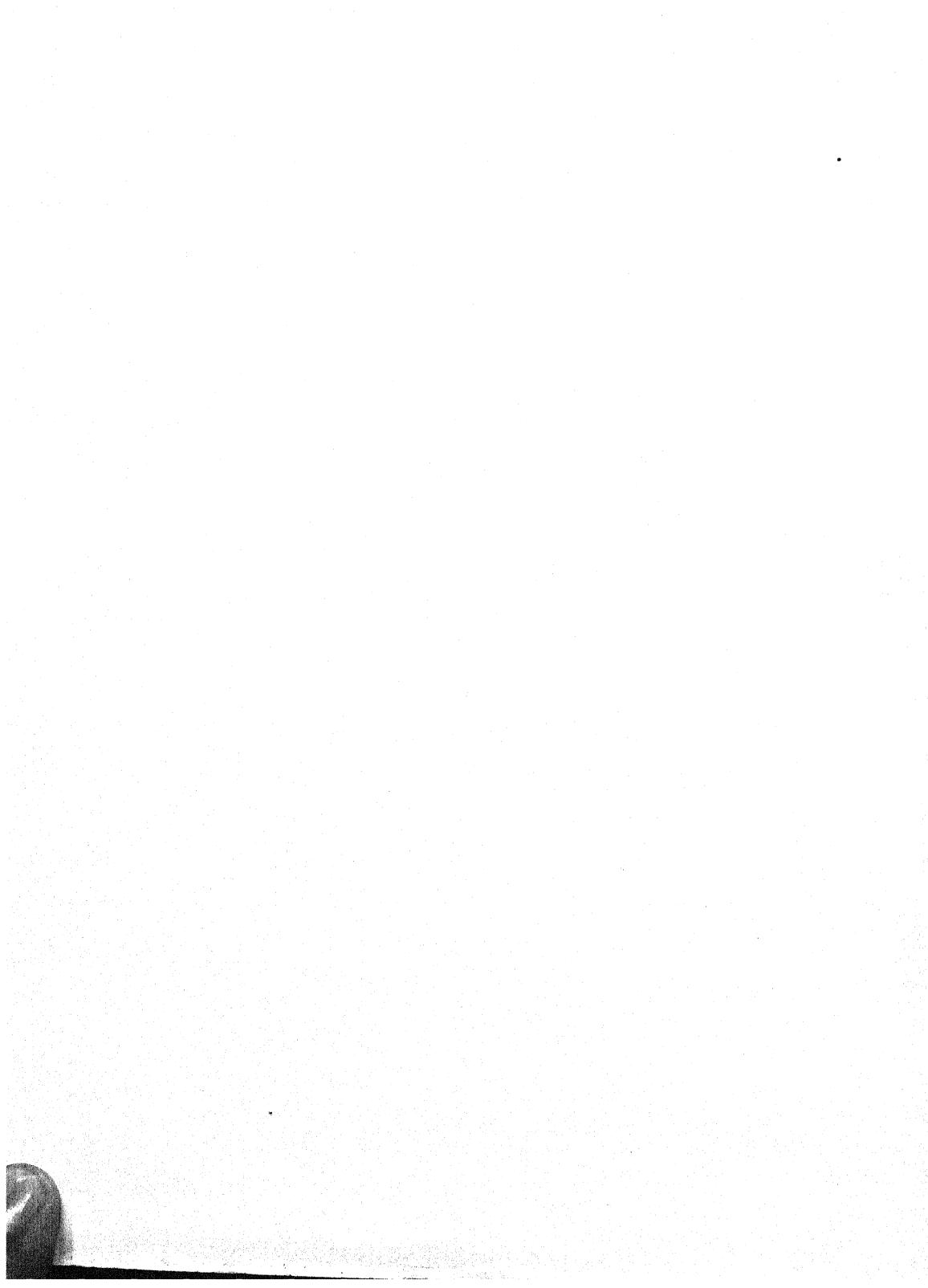
ELIZABETHAN FOUR-MASTER.

This contemporary print shows one of the royal ships of the year 1587. Notice the bonnet laced to the foot of the foresail.



EARLY SEVENTEENTH-CENTURY SHIP.

From the print by the Dutch engraver, Cornelius Danckerts, who was born in 1561.



almost falling off. It was not a pleasant prospect, but on the following day the weather eased up sufficiently for a dozen of the crew to leap overboard, and then, as long as ever they could bear it, they toiled under water at that rudder, lashed it with ropes, and finally made such a good job of it that it was quite serviceable and the ship could resume her voyage. But by the time the wretched men were hauled aboard they were more dead than alive. Such ships seem to us to have been tempting disaster all the time and on every voyage. If they happened to have charts, or globes, such information was scanty, inadequate, and unreliable. If they got caught in a hard breeze, how often one finds they were crippled by a sprung mast, or sails were torn. Anchors, cables, boats, and spars were lost; men died of disease by the dozen, others perished gallantly in fierce fights. And yet north to the Arctic, south to Cape Horn, west across the Atlantic and Pacific, these ships went looking for trouble and finding it, yet more times than not arriving home again after having been given up for lost.

It was the English seamanship, it was the English character which triumphed in the long run over these inconveniences and dangers. We know that well enough to-day; but neutral observers in the sixteenth century knew it just as well. Writing in that April which immediately preceded the coming of the Armada, Mocenigo, the Venetian ambassador in France, reported to the Doge and senate that Philip II very well was aware how much consideration ought to be paid "to such a fleet as the English fleet, both on account of its size, and also because the English are men

of another mettle from the Spaniards, and enjoy the reputation of being, above all the Western nations, expert and active in all naval operations, and great sea dogs."

In the ships of Spain (as we know from Richard Hawkins) the mariner was a kind of dog's body which anyone could kick. Although he, and his fellows, were the only seafarers aboard, yet they were treated as if of no account. For, there were the soldiers, the gunners, and the mariners which made up the crew. The soldiers "ward and watch," says Hawkins, and "this is the only task they undergo, except cleaning their arms, wherein they are not over curious." The Spaniards were themselves inexperienced in ordnance; they still regarded a naval fight in the same spirit as those who fought in the battle of Actium in 31 b.c.—a land engagement on sea. The soldiers were there for boarding, and these were the tactics preferred, whereas English gunnery was superior in its heavy ordnance.

Therefore the Spaniards had to get chiefly Flemings and foreigners as gunners, who were exempt from any duties other than their cannon. The result was that the unfortunate Spanish mariners were "but as slaves to the rest, to moil and to toil day and night; and these but few and bad, and not suffered to sleep or harbour themselves under the decks. For in fair or foul weather, in storms, sun, or rain, they must pass void of covert or succour . . . attend only to the tackling of the ship and handling of the sails . . . not permitted to shelter themselves, but to be still aloft, whether it be necessary or needless. So ordinarily, those which first fail are the mariners and sailors, of which they have the

greatest need." Sir William Monson has left for us other information confirming the unhappy existence in those Spanish ships which were badly kept, "like hogsties and sheep-coats," where the food allowance was too small and every man cooked for himself, where the holds were dark and odorous and lacking in ventilation.

And yet it must not be supposed that life aboard an Elizabethan ship was like a sojourn in the fresh green fields of Devonshire. It was only on July 29 that the Spanish Armada were so badly mauled off Gravelines that they never again became a consolidated fleet. And yet just three weeks later Howard had to report to Elizabeth the unhealthy condition of the English sailors in her fleet: "The infection is grown very great and in many ships, and now very dangerous; and those that come in fresh are soonest infected; they sicken the one day and die the next. It is a thing that ever followeth such great services, and I doubt not but with good care and God's goodness, which doth always bless your Majesty and yours, it will quench again."

Similarly, to us it seems amazing that the victualling arrangements should have been so defective at a time when England was about to go through such a crisis as only her fleet could overcome. On April 8, 1588, Howard (expecting the enemy to leave for the English Channel about May 15) has to write to Burghley that the victuals of the English ships will be finished by May 18, and, even when these supplies do come, it will take from four to ten days to get them aboard. He protested against only a month's provisions being allowed. "King Harry, her Majesty's father,

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never made a lesser proportion of supply than six weeks." Even during the progress of the fight on July 29, Drake had to add a postscript in his letter to Walsyngham, begging that care be taken to send the English ships victuals "whither-soever the enemy goeth."

As late as June 22, a month before the Armada were coming up Channel, Howard was compelled to write again with the same complaint. "My Lords," he addressed the Council, "our victuals are not yet come, but we hope shortly to hear of them if this wind continue 40 hours, or else we cannot tell what to think of them, or what should become of them; and yet we have sent three or four pinnaces to seek them out. If they have not come, our extremity will be very great for our victuals ended the 15th of this month." And the same bad arrangements existed in regard to the men's pay. If there is one item more than lack of victuals that is liable thoroughly to infuriate the seaman, it is the delay in receiving his wages. If there is one thing that no senior officer should, in the midst of an historic campaign, have to be worried about surely it is this. And yet, in his report of July 31, relating the Channel operations to Walsyngham, John Hawkins has to add: "The men have been long unpaid and need relief. I pray your Lordship that the money that should have gone to Plymouth may now be sent to Dover."

The English seamen who broke the Armada menace were to receive as wages the sum of fourpence a day, paid quarterly. This cannot be regarded as excessively high, even for those days. Any who were wounded and survived were not

AT SEA IN THE SIXTEENTH CENTURY

provided with state pensions, as after the Great War in this twentieth century. On the contrary, they received begging licences in their extreme poverty, so that they might appeal to others "to have a Christian and pitiful regard" for one in "his extreame want and miserie gotten in the service of our gracious Prince." Yes: the sailor of to-day, with all his improvements in pay and prospects, his better food and better ships, cannot for a moment envy the Elizabethan seafarers the conditions of the sixteenth century.

CHAPTER VIII

SHIPS OF THE SEVENTEENTH CENTURY

THE period of the seventeenth century is that when the last strain of mediævalism as to rigs becomes merged in that more powerful modern stream which was now setting in. It was a time when alterations were taking place, sometimes healthy and sound in principle, but often debased and decadent. If the Elizabethan shipmen were rough, hearty, brave in their methods and manners, the seventeenth century attempts to become more scientific, more inquiring ; yet decay there undoubtedly was in seamanship, in strategy, and in the corruption which existed in high places.

But it is impossible to sum up that age in a few sentences, for it is so full of contradictions. Never in the whole history of naval architecture did ships become so ornate of hull, so begilded and decorated as real works of art ; there was a real impetus in the study and propagation of the seamen's art, as we know from the amount of effort that was spent in writing papers on tactical problems, on the publication of seamanship works, and the careful progress in building ships of unprecedented size, with great complication of rigging. Such a ship as the *Souveraine of the Seas* in its daring, its majestic size and amazing ability, is a veritable land-mark in our

SHIPS OF THE SEVENTEENTH CENTURY

study. And yet, if you please, this was actually the century in which four galleys were built for the Navy !

It is an age full of anxiety, intrigue, corruption, and political unrest at home, international jealousy at sea, culminating in the Anglo-Dutch wars. Gone was the pioneer character of the sixteenth century, missing are those high adventures which had given such a glamour to ship life. And yet, for all that, the Stuart period was to be one in which hulls and rigging and seamanship did make immense strides, without which those historic events that were to follow in the wars with France would have turned out very differently. Two things must be borne in mind before we approach this seventeenth century at the beginning. Firstly, as we know from contemporaries, England was still a poor nation, and though the routes to the East and West Indies were now known and being developed, yet if the trade had not yet commenced to flow freely, trade was to come. The commodities of England were not yet in great demand, although English ships had been largely engaged in carrying goods into foreign harbours. But this difficulty had begun to be met by those small trading squadrons which were fitted out and sent by London merchants to distant parts, returning with the produce which had been bartered from the natives. The English East India Company had so prospered by the year 1681 that it owned a fleet of thirty-five ships ranging from 100 to 775 tons, and the company was paying in customs alone over £60,000 annually. But, secondly, though unquestionably the Stuart sovereigns cannot be accused of being indifferent to the sea service, or of not

THE SHIP UNDER SAIL

affording it money, yet they meddled and muddled in matters which were more strictly the sphere of technical experts.

The sailor's profession was still scanty in men, but it was growing, and too little emphasis has been placed on the source of seamanhood which was kept going by our fishermen. Without these and the coasters there would never have been crews enough to man those big war-ships and East Indiamen which began to be built. Fishing has had a far greater influence on the world's history and development of rigs than most people realise. Now it had happened that in the fifteenth century the herring changed its residence and began, thereby, to change European politics. This fish, instead of spawning in the Baltic, now came to the North Sea, with the result that the Dutch found a silver-mine off their very coasts. The herring fishery became so prosperous that it needed all the men and all the ships which could be spared. Wealth flowed into the Low Countries, more men took to the sea, fleets of haringers had to be built, and from this money and because of these men soon came those exceptionally fine ocean-going ships which the Dutch East India Company caused to be built for their growing trade with the East. Thus we see the truth of that expression that Amsterdam was built up on the bones of the herring. The Dutch went ahead both in fishing vessels and in freighters: they became in fact the great carriers of the North, as centuries before the Phoenicians had been of the South. And sooner or later this was bound to have its crisis in the Anglo-Dutch wars. Commercial jealousy could end only in fighting.

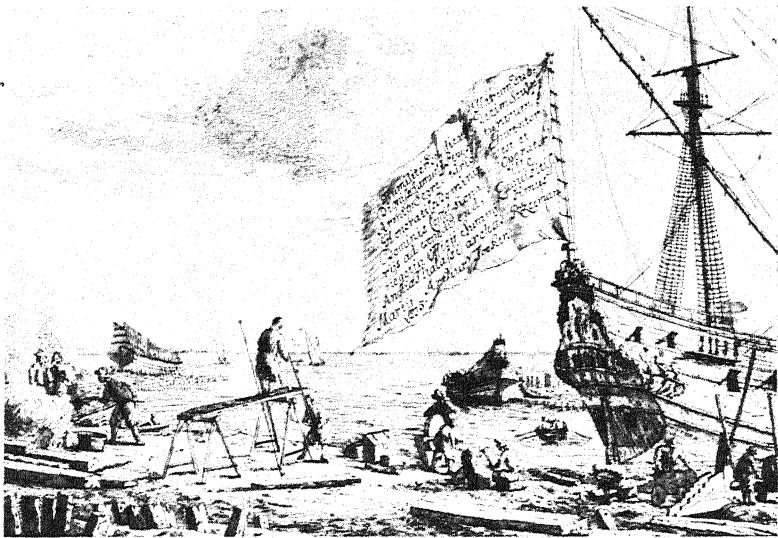
SHIPS OF THE SEVENTEENTH CENTURY

Before proceeding to discuss the ocean craft, let us glance then at the fishing fleets. Fortunately the Dutch artists in the time of Netherlandish wealth were employed to paint these vessels, and I have examined practically every example in the museums and galleries of Holland, as well as many other instances. Herring "busses," slow, round, tubby, but convenient for lying to their nets and for entering the shallow havens of their own country, are noticeable features in Dutch art; but even by the beginning of this seventeenth century they employed "vent-jagers," or fast fish-carriers, to hurry the fleet's catch into port. So well were the Holland fishermen doing that by the end of the century 8,000 craft and 200,000 men were employed, bringing in £5,000,000 a year into that country. Now the two principal types of craft used were the "buss" and the "dogger."

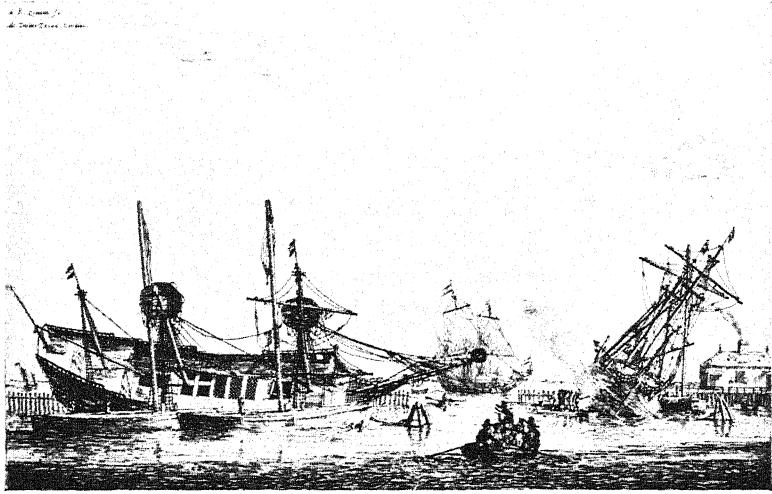
With regard to the first: the mediæval Venetians owned "buзи," and throughout the Romance and Teutonic languages this word has always indicated fishing craft. Seventeenth-century English fishermen of the North Sea got the word "buss" from the Dutch. The oldest picture I have been able to find of the "haring buys" is that by Elandts, which is in the Municipal Museum at The Hague. Painted in 1664, it was made from a picture of 1570 and consisted of two masts, each having a square sail, the main-mast being very much taller than the foremast. Braces with pendants are shown on the mainsail, and both yards are kept to the masts by parrels. This is just an open boat with three hands and I should estimate her length

at about 25 feet. In Wagghenaer's *Speculum Nauticum* of 1584 we have a similar but three-masted craft riding to her nets with fore and main masts lowered. In the Boijmans Museum, Rotterdam, there is a picture by Jacob Bellevois painted about 1652, which shows two busses. One is two-masted, with square-sail on each mast, but that on the main is very much bigger, and the foremast is right in the eyes of the ship. The second ship is riding to her square mizzen, the mainmast is lowered, and the foremast is partially lowered. There are plenty of other instances of these ships, and it is noticeable that the hull shows marked ancestral likeness to the Scheveningen pinks which will be familiar to many who have visited the Dutch coasts. Keymer, who in 1601 wrote on Dutch fishing, describes these bigger craft as being from 60 to 200 tons and carrying from 40 to 100 lasts. The anonymous author of *Britaine's Busse*, published in 1615, describes them as being of from 35 lasts, or 70 tons, measuring 50 feet on the keel, with a beam of 17 feet.

As to the "dogger" type we cannot say exactly how she differed from the "buss," though the word is much older than the seventeenth century. Instead of using nets, they were line fishers for cod and ling, their size in the century we are considering varying from 60 to 100 tons. In actual hull and rig they were not dissimilar from the buss type. In its proper place we shall investigate the origin of the fore and aft rig, but whilst passing we can see from these square-rigged fishermen how easy was the transition from the older fashioned rig to the lugsail.



SEVENTEENTH-CENTURY SHIPYARD.



SHIPBUILDING IN 1675.

These two contemporary prints are bound at the end of Sir Anthony Deane's *Doctrine of Naval Architecture* manuscript in the Pepysian Library, Magdalene College, Cambridge. The photographs are in the Science Museum, South Kensington. The etchings were by Renier Zeeman, published by Arthur Tooker and dedicated to Samuel Pepys. The lower picture of a ship being careened gives an authentic view of a seventeenth-century deck.



SHIPS OF THE SEVENTEENTH CENTURY

A comparison of these old busses with the modern Scotch luggers furnishes much interesting material for study.

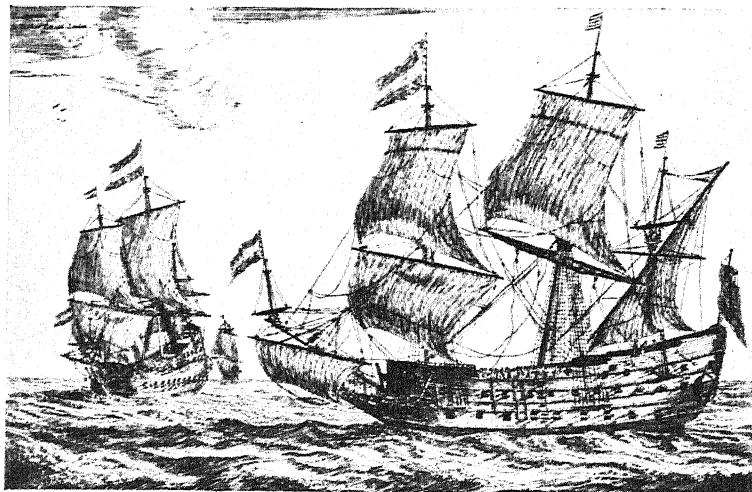
But we come now to the big ocean-going craft, and broadly speaking, these consist of the vessels owned by the Navy, and those owned by the East India Company. With the limited space at our disposal, we can but give representative types. An essential difference to be noted is, that owing to the shallowness of the water off their coasts, and the multiplicity of sandbanks in their harbour approaches, the Dutch men-of-war and East Indiamen were of less draught than the English ships. Small Dutch ocean-going vessels, such as the *Half Moon* which carried Henry Hudson across the Atlantic, had no galleries round her stern, were rigged as three-masters with spritsail, courses, fore and main topsails, the usual bowlines, braces and sheets, but of course lateen mizzen, which we shall see surviving for a long time yet. You will remember that this great English navigator and explorer Hudson, after making passages for the Muscovy Company, was employed in the service of the Dutch East India Company.

During the first quarter of this century square topsails on the mizzen are in use, and t'gallant sails on the fore and main. In the Dutch fleets the round sterns are noticeable in the "fluitschip," a craft that looks quite small beside the loftier vessels, yet extremely convenient for narrow waters. I have before me a copy of a great and powerful Dutch East Indiaman painted by Vroom, who died in 1640. The vessel is just arriving from the East into one of the Dutch rivers. She is a four-master, with the modified

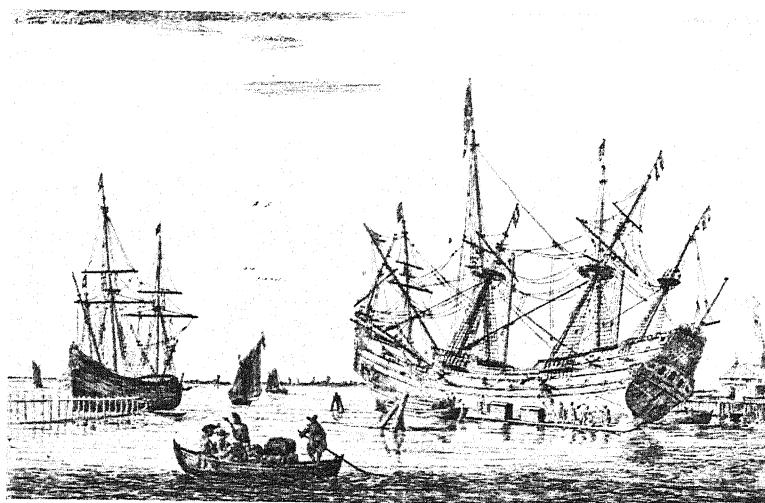
THE SHIP UNDER SAIL

sixteenth-century beak, and a veritable joy to behold. What would we not give to be allowed to tear back three centuries, go aboard at the waist, and then aft to that lofty poop deck! Hands are seen in the picture aloft, in the rigging, in the tops, along the main-yard. She is about to anchor; already the spritsail yard (suspended from the "boltsprit") is seen with its sail stowed along it. The two lateens on mizzen and bonaventure mizzen-masts have been stowed long since, as also the square topsail on each of these two mizzens. The crew have almost finished stowing the mainsail to its yard, the main topsail and fore topsail are just being lowered, and presently the ship, running before the wind, will be under foresail only. She has still plenty of way on, but her distinguished passenger, Cornelis Houtman, has climbed down out of her into an open boat and landed on the sandy beach.

In the reign of James I the English East India Company had built for them an important ship of 1,100 tons named the *Trade's Increase*. She was a fine ship, but had the bad luck to end her days in Java at the end of her first voyage. In that reign, too, was constructed for the Navy the 1,200-ton *Prince Royal*, the finest man-of-war in her day and the largest vessel that had ever been designed for the English Navy. Double-planked, decorated externally with carvings, she had two decks with guns and an armed upper deck. Built under the supervision of Phineas Pett, one of that famous and illustrious family which went on designing and building ships for the Royal Navy from the time of Henry VIII to the reign of William and Mary, she



SEVENTEENTH-CENTURY THREE-MASTERS.



SEVENTEENTH-CENTURY SHIPS FITTING OUT.

From the etchings by Renier Zeeman. (See details facing p. 104.)



SHIPS OF THE SEVENTEENTH CENTURY

was eventually safely floated, though the first effort had been unsuccessful. We see now the figurehead becoming a regular feature in big ships, a custom that is still preserved in that five-masted barque *København*, of the twentieth century.

In the time of Charles I sea-going pinnesses of about 50 tons and under, having both sails and oars, were built, square-rigged, three-masted, and with two decks. But they were both over-sparred and over-ordnanced; for the mistake was made then, as for some years to come, of building these smaller ships merely as models of the biggest craft. But by 1618 a steady improvement in ship design and rig had begun, and the wise policy introduced of cutting down those huge upper-works. There was a rough-and-ready rule that the best ships should be of a length three times that of their beam, with not more than 16 feet draught, without double galleries and lofty upper-works, which impaired their seaworthiness.

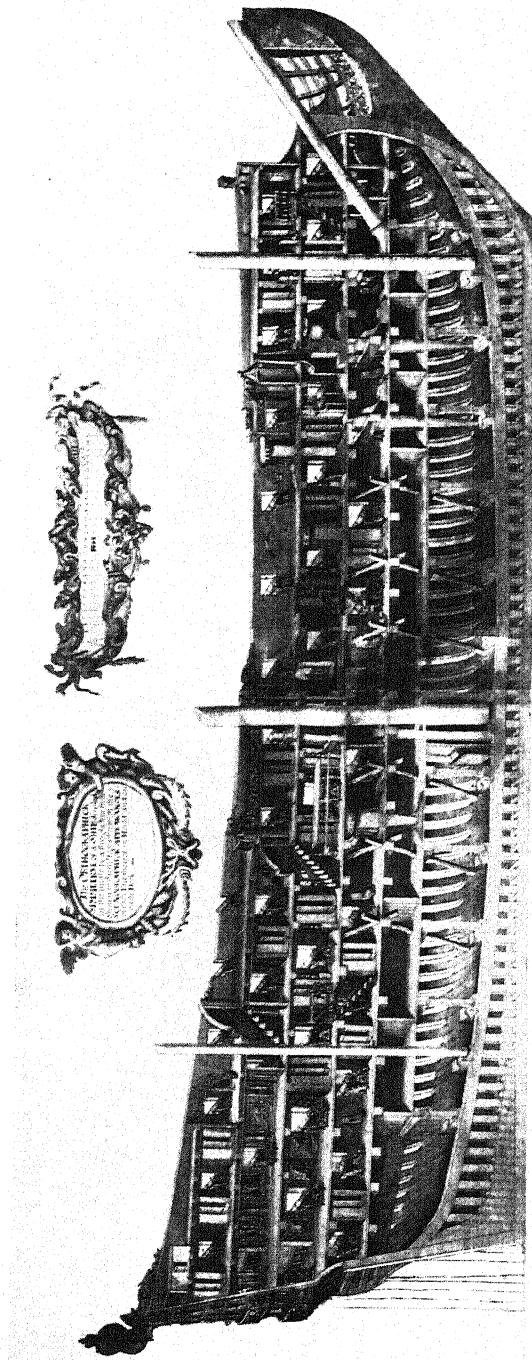
We have documentary evidence that these Stuart ships sailed much faster on a wind than when running free, but the fastest ships known to north European sailors in the fourth decade of this century were the Dunkirk frigates, which had a length of about four beams and were engaged in the pursuit of privateering which flourished for so many generations among seamen of that port. The Royal Navy in 1636-7 owned the *Nicodemus*, which had been built at Dunkirk. Her "captain and company report her to be the most absolute sailer in the world; for she runs from every ship she sees . . . as a greyhound doth from a little

dog." We were still learning from foreigners, as we always had done and always have.

But piracy was still a great danger to our growing shipping. English pirates, Barbary corsairs who thought nothing of coming north from the Mediterranean to the Narrow Seas, and Dunkirk privateers made it necessary that the Caroline fleet should protect our merchantmen. In 1626, for instance, vessels bound from Weymouth, Dartmouth, and Plymouth for that famous fishery off the Newfoundland Banks, which was to do so much for our adolescent seafaring, were only a few of the losses caused by these rovers, who were wont to operate off the approaches of the "Sleeve"—that is to say, the English Channel. The French, of course, still refer to the English Channel as "La Manche."

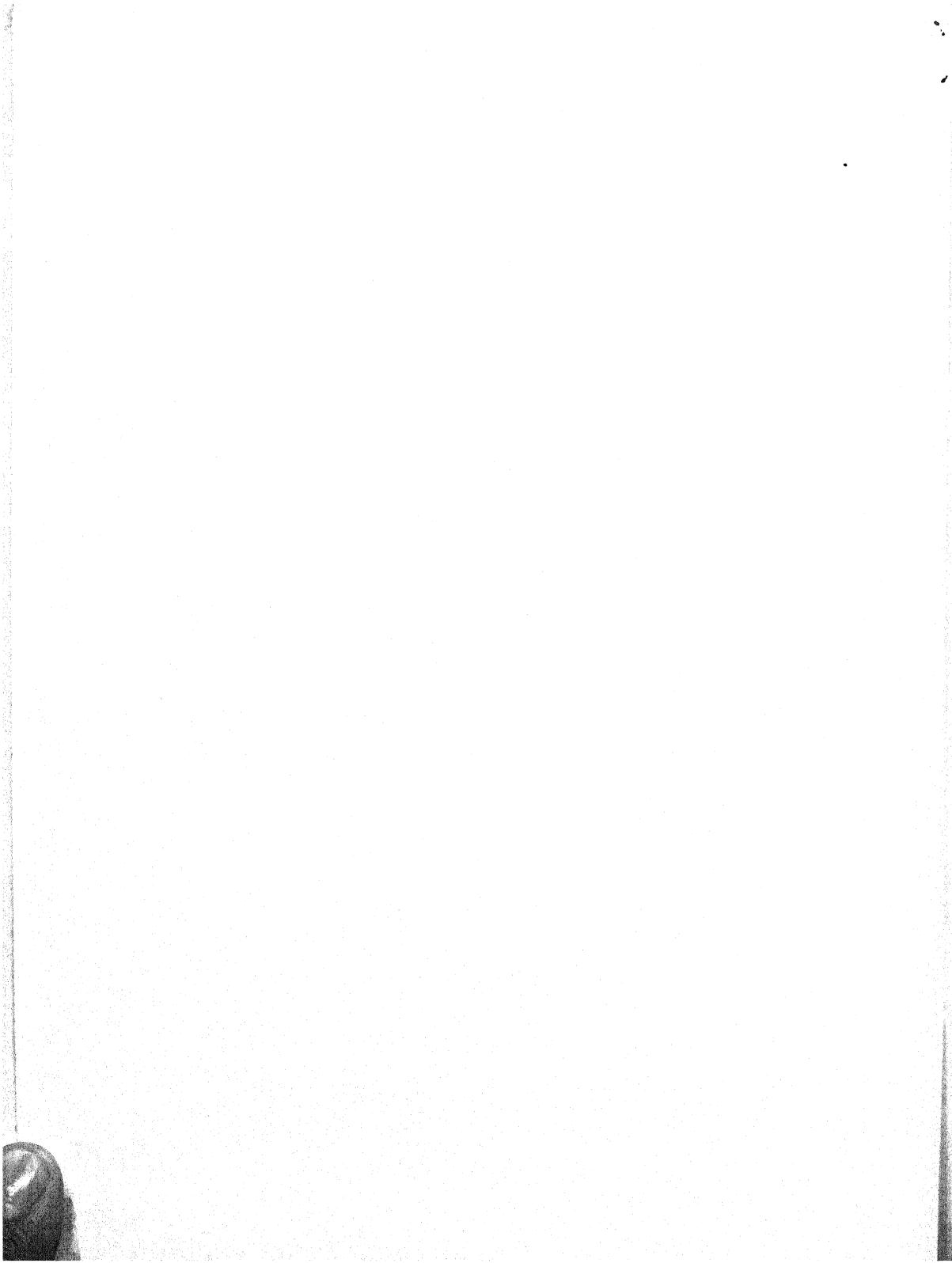
There were, however, grievous defects in the ship-money fleets of Charles I, which caused the greatest anxiety to their captains. Monson wrote in January 1635-6 making unfavourable comparisons with the Elizabethan vessels. "In the last voyage," he affirmed, "I have seen more topmasts carried by the board in a reasonable gale of wind than I have known in great storms in the Queen's time when we have kept the seas four, five, or six months together and never anchored in all that space." Captains complained of the "illness of their masts," the "ill cordage," as well as the "leakiness of so many of his Majesty's ships."

We mentioned just now the use of the word "frigate." It is curious how throughout history both branches of the sea service have employed the same word to denote quite



INTERIOR OF A SEVENTEEN-CENTURY MAN-OF-WAR.
This three-decker gives a contemporary view of the cabins and internal arrangement of a warship of about 1680, from Mr. Dunne's *Draughts of an English Man-of-War* in

the Pepysian Library, Magdalene College, Cambridge. Photograph in Science Museum, South Kensington.



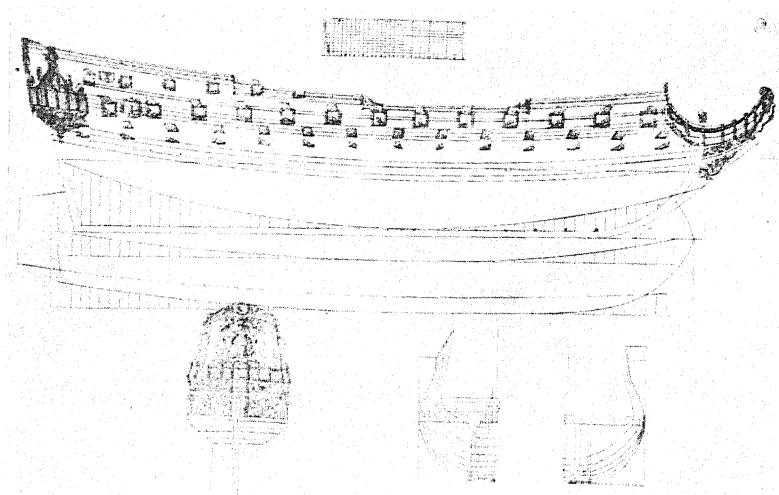
different classes of ships. As an example, the word "sloop" has been used to mean anything from a cutter-rigged sailing craft to a steam vessel built for mine-sweeping. A cutter may mean anything from a yacht to a steam pilot or a ship's boat. So originally the term "frigate" had come from the Italian "fregata," and, as we have seen, was applied to those swift-sailing Dunkirkers. But somehow, during the Commonwealth, "frigate" was applied to ships both great and small. Thus Blake, in reporting the battle of the Kentish Knock, speaks of the famous *Souveraigne of the Seas* as "that great ship, a delicate frigate." Perhaps the reason may lie in the fact that when soldiers came afloat and became "sea generals" they were apt to get a little mixed up in the terminology of the sea, and thus the inexactitude was promulgated. Later on the word was to get back to its rightful use.

This *Souveraigne of the Seas* was a most historic ship. Perhaps she was more impressive than useful, yet certainly she was the most ornate and the largest vessel afloat. We can admit also that she was crank and unwieldy, and had a narrow escape in the battle just mentioned. For Blake mentions that "the water being shallow upon the sands, we were in some danger of sustaining great loss, in so much that" this ship "began to stick, but, blessed be God . . . got off again without any great harm thereby." And yet this imposing vessel had an interesting war record. In most of the engagements of the Anglo-Dutch wars she took part, and she was capable of impressing any enemy with her hundred-gun armament. Built in 1637, she was in

THE SHIP UNDER SAIL

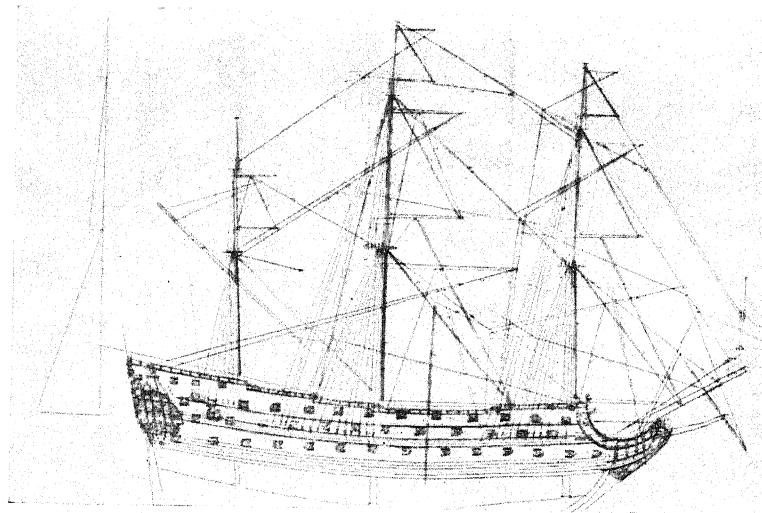
that same year of the Kentish Knock battle cut down. In 1684 she was rebuilt and named the *Royal Sovereign*, but in 1696 was accidentally burnt at Chatham through the carelessness of a boatswain, who left a lighted end of candle on a shelf in his cabin when he went up on deck to keep his watch.

This was the first three-decked ship of 1,683 tons, length (probably taken on the gun-deck) 169 ft. 9 in., beam 48 ft. 4 in., depth of hold 19 ft. 4 in. She was designed by Phineas Pett and built by Peter Pett. There is a model in the Naval Museum at Greenwich which was made by the orders of the Admiralty to the original draft of Phineas Pett. The weight of the *Sovereign of the Seas'* anchor was three tons, and altogether she was a very wonderful ship in all details. It would seem that after she was cut down to two decks in 1652 she ceased to carry royals, for Hayward, in his book published eight years later telling us all about her rigging, says nothing about any mast or sail above t'gallant. But in the well-known print of this ship she is seen rigged as follows, reckoning from forward to aft: below the bowsprit is the spritsail, but there is shown also a small mast at the end yet on the upper side of the bowsprit, like a glorified jackstaff. This sprit topmast sets a small fine-weather square sprit topmast sail. On the foremast are set foresail, a big topsail, t'gallant sail, and royal. On the main are mainsail, topsail (also big), t'gallant sail, and royal. The mizzen-mast carries lateen sail, a bare cro'jack yard above, then a moderate sized topsail and small t'gallant sail.



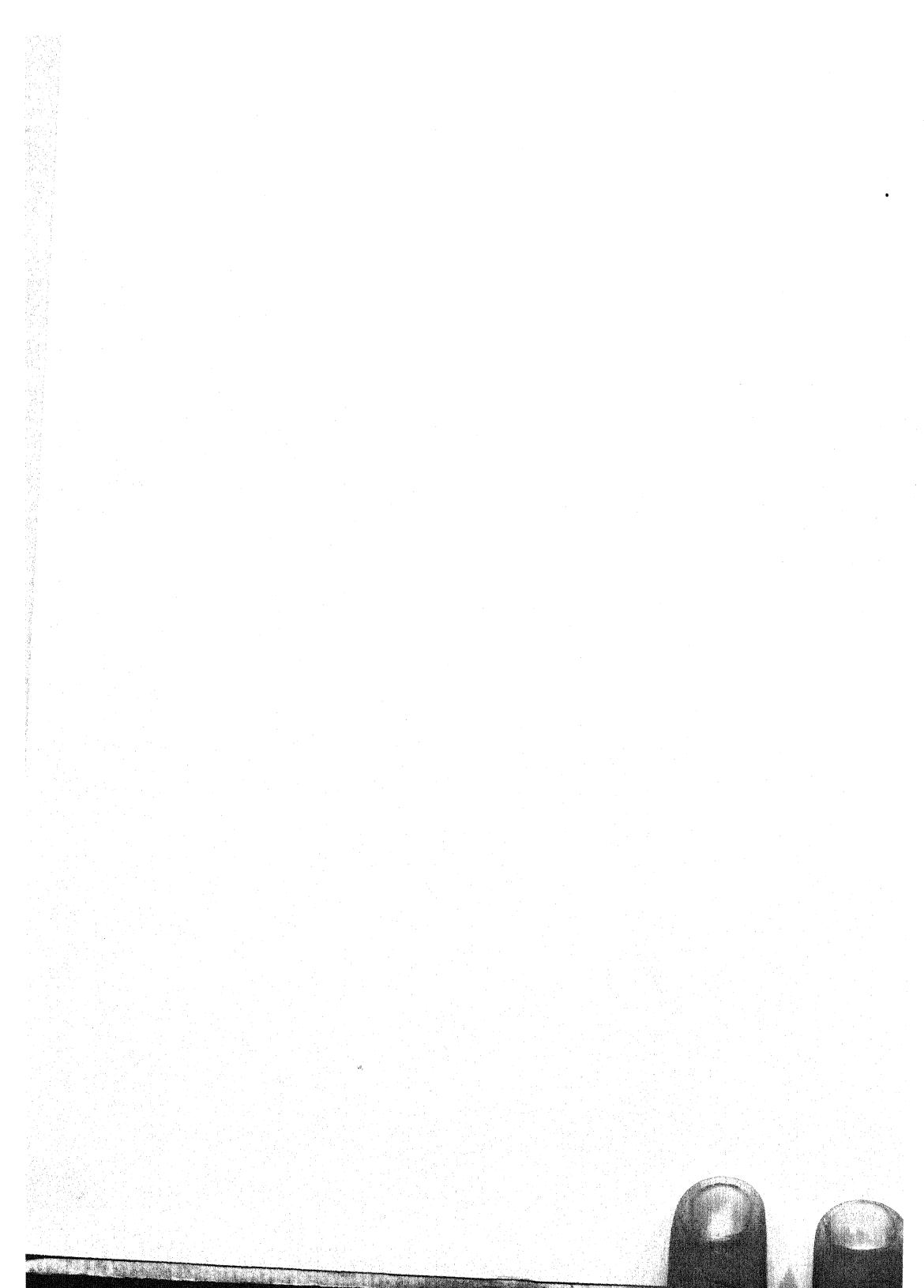
DESIGN FOR A THIRD-RATE.

From Sir Anthony Deane's manuscript *Doctrine of Naval Architecture*, 1670, in the Pepysian Library, Magdalene College, Cambridge. Photograph in Science Museum, South Kensington.



RIGGING PLAN OF A FIRST-RATE.

From Sir Anthony Deane's manuscript *Doctrine of Naval Architecture*, 1670, in the Pepysian Library, Magdalene College, Cambridge. Photograph in Science Museum, South Kensington.
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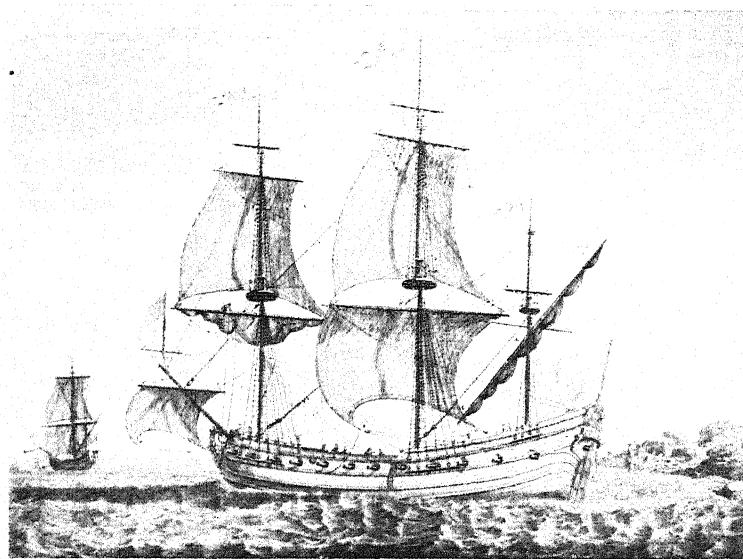
SHIPS OF THE SEVENTEENTH CENTURY

This is the first time in our story that we have to mention the adoption of royals. The increase of the topsails' size is remarkable, but the lateen mizzen now is so well inboard that "outlickers" are not required. The high-steeved bowsprit is a formidable affair with a shroud-like gammon. The foremast is stepped just as far forward as it can possibly go, the massive forestay coming down to within about a quarter of the extreme end of this spar. The sprit top-mast is supported by stays and crowsfeet arrangement from its top on to this forestay. The mainmast is amidships, supported by twelve shrouds on either side, though ten was the usual number in other ships of this time. The fore and main channels are just above the lower deck, but those of the mizzen are much higher up. The placing of the channels low down on the ship's side had become essential owing to the excessive tumble home of these seventeenth-century ships. But this narrowness of beam had gone too far, and Sir Anthony Deane observes that it was not till 1673 that this was realised. "As to our 3 deck ships, the French and Dutch build them upwards of 44 foot broad; but we build none of our deck ships of the 3 Rate above 41 broad, and several under . . . his Majesty has directed those nine three-deck ships of the 2nd Rate built and abuilding to be near 45 foot broad, which is another improvement we had not till the year '73, the builders of England before that time having not well considered it that breadth only will make a stiff ship."

As we look at these Stuart vessels, perhaps nothing strikes the eye so obviously as the loving decoration of hulls.

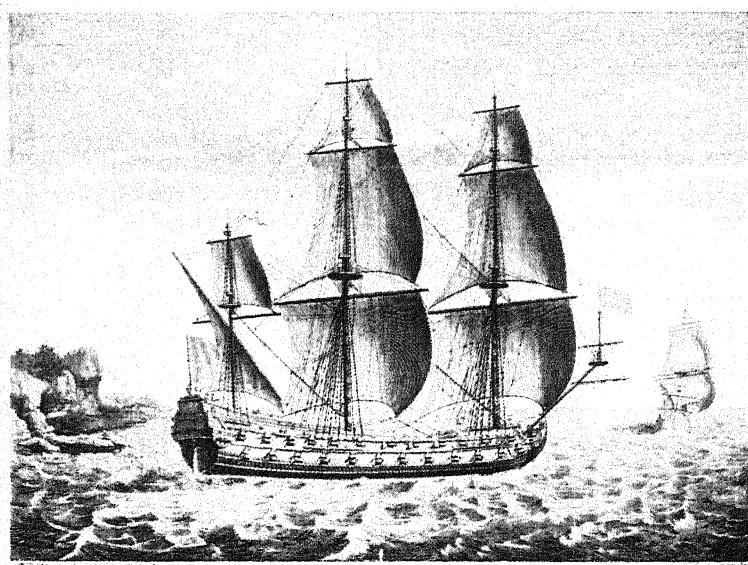
Beautiful gilt wreaths and elaborate carvings, emblems of land and sea figures, angels and cupids, the carefully wrought figurehead all embellish the actual naval design. During the Commonwealth, puritan influence stopped all gilding and restricted ornate decoration generally. In 1655 this restriction was relaxed for a while.

During the latter half of this century an interesting innovation was also brought into Dutch cross-rigged ships by the introduction of fore-and-aft triangular staysails—not yet for'ard of the foremast as headsails but—for'ard of the mainmast. Why introduced from Holland? The reason is that already they had developed the fore-and-aft rig, and it was a simple matter to convey part of this idea to their East Indiamen and men-of-war. But English ships were alive to all these foreign improvements, and we shall see this as we continue our investigations in this fascinating subject. But for exquisite stern carving, it would be difficult to have surpassed that of the famous French *Soleil Royal*, of 1,940 tons.



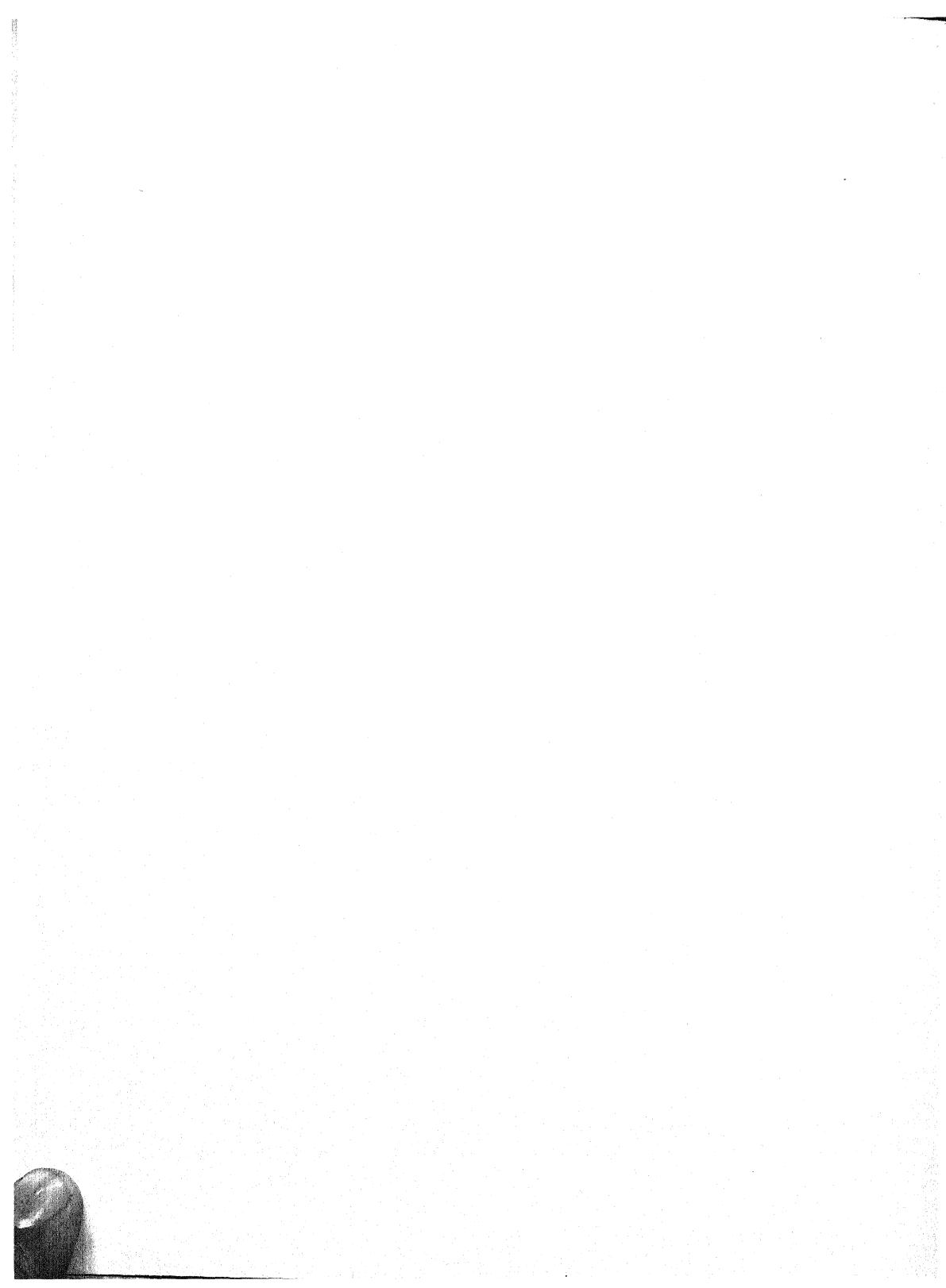
FRENCH "FLUTE" SHIP.

A fast, light vessel of the late seventeenth century, from a contemporary print by a French naval officer.



FRENCH THIRD-RATE.

Of the late seventeenth century, from a contemporary print by a French naval officer.



CHAPTER IX

EIGHTEENTH-CENTURY RIGS

ONE of the great results from the Anglo-Dutch wars was the impetus which these hostilities gave to naval seamanship and tactics. And as the rig of warships became more complicated, so the demand for professional proficiency naturally increased. In those romantic Tudor days, so near to the influence of Mediævalism, the dominant idea of carrying out a naval victory was to lay your ship alongside her opposite number, board her, and then carry on as in a private quarrel. The introduction of guns only gradually changed this idea, for it needed actual warfare to prove that the modern fashion was really superior to the battle usage which had been going on since the time of ancient Greece and Rome.

When guns were used in the sixteenth-century galleys, most of them fired straight ahead (always excepting of course galleasses), for their tactics were end on and they still went into battle in line abreast, as at the historic Lepanto in 1571. But in the seventeenth century we not only had guns at the side as the main armament, but we even had three decks of these. The problem, therefore, was how to use these rows of armament to the best advantage. At the very end of the Tudor period the theory was just coming in that a squadron or fleet of ships armed with

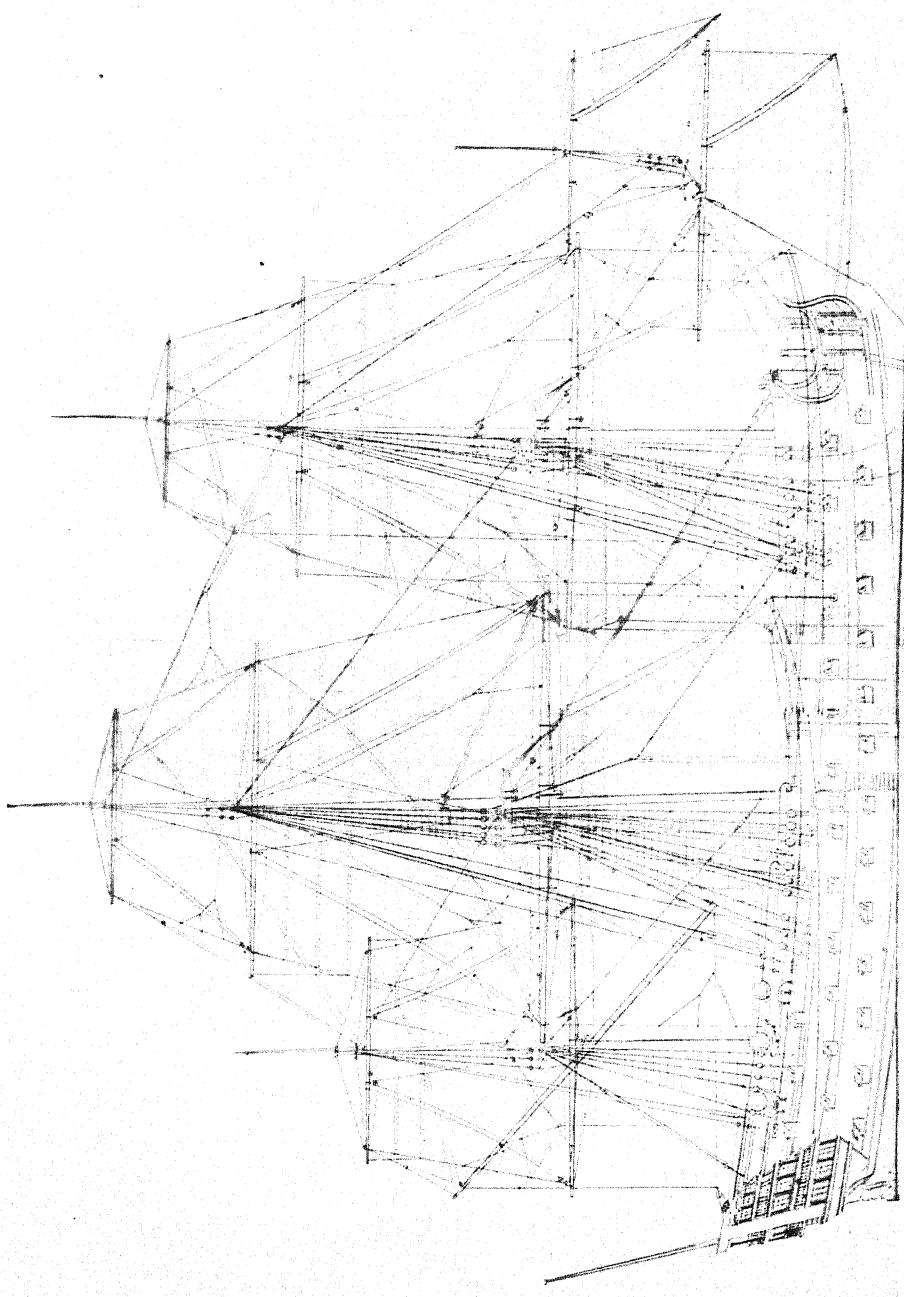
THE SHIP UNDER SAIL

guns at either side would be best disposed if formed in line ahead. During the seventeenth century this theory was proved in actual warfare, so that finally naval officers were instructed to maintain line-ahead formation, and on pain of death to avoid firing over their own ships. From this there grew up two distinct schools. The first insisted on strictly formal tactics, while the other permitted tactical risks to be undertaken, leaving room for personal initiative. ~~An~~ since this eighteenth century was essentially a formal age, the first-mentioned school held sway for the present.

How does this affect the development of the man-of-war's rig? The answer is that we have to provide ships that are fit to lie in the line of battle, able to carry the heaviest armament, and yet to manoeuvre not as individuals but as units of a squadron or fleet. From this it follows that homogeneity, a standardised type, will be created and repeated. But for special purposes, other than fighting in line ahead, special types of vessels must be designed and built. In other words, specialisation comes in, the cleavage between the Navy and the Mercantile Marine begins, and the big ship must be confined almost exclusively to the duty of being a line-of-battle ship. Of course in the seventeenth century there were as many different types of naval craft as first rates, second rates, third rates, fourth rates, fifth rates, sixth rates, small sloop-rigged converted merchantmen called hoys, sloops, ketches, pinks and yachts, all of which, with hulks, comprised the Navy at the time of the Restoration; but the eighteenth century

ENGLISH SECOND-RATE.

This shows the rigging and sail plan of an English second-rate man-of-war of the establishment of 1714 from a manuscript drawing.





EIGHTEENTH-CENTURY RIGS

is a period less of invention than of selection and modification in details.

It was the French who taught us how to improve our naval architecture by a refining influence. The fact, however, remains that throughout the eighteenth century ours was inferior both to the French and Spanish. But as it has always been a very English characteristic to learn from our neighbours and improve on their ideas, so it was from prizes captured that we learned to model our best fighting ships. France, for instance, during a long time gave up building three-deckers, as she considered them only of real service when bombarding batteries and fortresses. Instead, she based her ideas on evolving a type of ship which in the worst weather would afford the best platform for the longer range guns now in use. It was a direct infringement of that old English idea of building lofty ships for "majesty and terror of the enemy." In other words, the aim now, as in tactics, was to do everything to help the gunners to increase the warship's powers of attack. And it is to the scientific insight, the bold experiments, and studious application of experience that the dimensions and lines of the French vessels so distinctly were superior to ours in this century.

By the year 1713 Great Britain was ruler of the seas, but then during the period of peace the Navy became neglected and reforms had inevitably to follow. In tactics, the blind adherence to the fighting instructions became such that officers considered it almost better to fight and lose a battle, according to the approved system, than to win by

THE SHIP UNDER SAIL

breaking the letter of the law. It was Hawke who broke through such uninspired mental servitude, and Rodney who gave shape to the new ideas. And so with the battleships themselves a sad period of decadence had been reached by the middle of the century. Thus Admiral Vernon, writing in 1744, in comparing the present ships with those built under Charles II, complains that it is certain the latter "were ships of great strength and long duration, and that our modern ones are neither; but, to the great cost of the Crown, have been found eminently defective in both." And speaking of the French he says: "They don't generally crowd their ships with guns as we do; in which I think them much in the right, and that we cripple our ships by it, without any real conveniency arising from it."

Other officers complained of the "badness" of these ships for sailing, the inferior materials used in building them, the bad workmanship, and the bad accommodation for the men. The lack of homogeneity and standard brought about confusion, loss of time, and expense. Thus, supposing a squadron were required to be fitted out, there was no standardisation of masts, yards, sails and rigging for vessels of the same number of guns. The result was that each ship, though of the same armament, had to take promiscuously whatever spars and stores she could get and alter them at sea. Similarly with the gun-ports; these were of different sizes, so that the gun carriages of one ship would not fit those of another. It was therefore suggested that the scantlings of timbers and beams, the number of ports

EIGHTEENTH-CENTURY RIGS

and nature of guns, and the number of men should be the same for all ships of a similar rank. Furthermore, it was pleaded, these should approximate to the figures of the French and Spaniards.

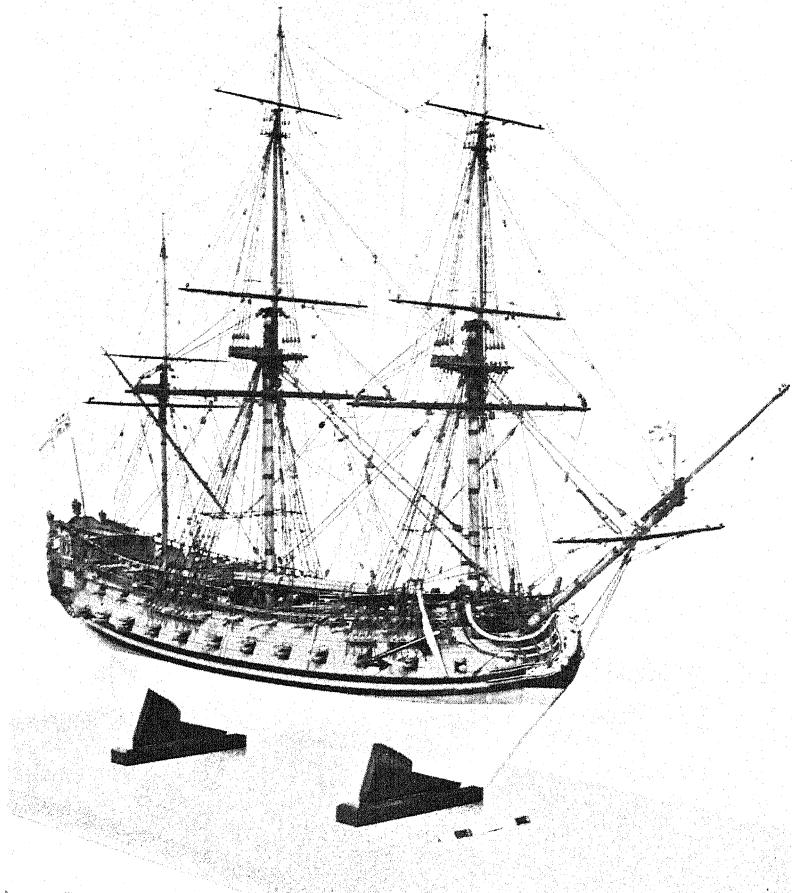
The latter had both outsailed the British fleet in the Mediterranean, and such a condition of things was a slur on both our ships and officers. The lack of durability of hulls was due partly to the use of unseasoned timber; but there was also a great lack of seamen. Everyone who has read *Anson's Voyage Round the World* remembers the difficulty he had in getting crews. And by the time the *Centurion* had been away from England a year there were of his 500 people only 213 alive, many of whom were in a weak condition. The best of the men had been taken from merchant vessels, herded together in unhealthy quarters where sunlight never penetrated, living on bad food, badly paid, and punished brutally. As an eighteenth-century writer observed, the "Mariners in the King's Ships have frequently put their 24 hours' allowance of salt provisions into their tobacco-boxes."

"It will be necessary," Admiral Vernon warned the Admiralty, "to reconcile the affections of the seamen to the public service by a more humane treatment than they are at present subject to. I have long lamented their situation, and made some faint attempts towards relieving it." Can we then wonder that before the century was out there was a mutinous spirit in the Fleet? And yet, in spite of all these defects in ships and tactics and officers —one has only to think of Benbow's disloyal captains

—and men no less than in administration, the Navy of England was to distinguish itself in the Seven Years War, because many of these glaring defects had been already attended to.

We may pass now to consider the details of this eighteenth-century seafaring. There are three most interesting innovations that stand out conspicuously during this period. About its beginning we see triangular headsails introduced into the biggest ships. Owing to the experience of the Anglo-Dutch wars, when these unhandy craft had to go about in the proximity of shoals, the need for those sails such as were used in contemporary Dutch fore-and-aft craft was seen to be great. Of course the introduction of staysails had already been made, the spritsail under the bowsprit still continuing for the present. During the first half of this century the French also adopted triangular headsails, and the commencement of that epoch had seen the use of fore staysails, main staysails, fore topmast staysails and main topmast stun'sls. By the middle of the century staysails and triangular headsails had become quite unexceptional, and two spritsails instead of one were set below the bowsprit. As to the sprit topmast, this had to disappear, for it was obviously in the way of the big jib, especially when going about. But when in harbour or at anchor, the jackstaff was still retained in order to fly the Union Jack.

The second notable change of this time was in regard to the mizzen. This sail, as we have seen, had been introduced into the ocean-going ship from the small lateen craft of the Mediterranean, and so it had continued. But now it

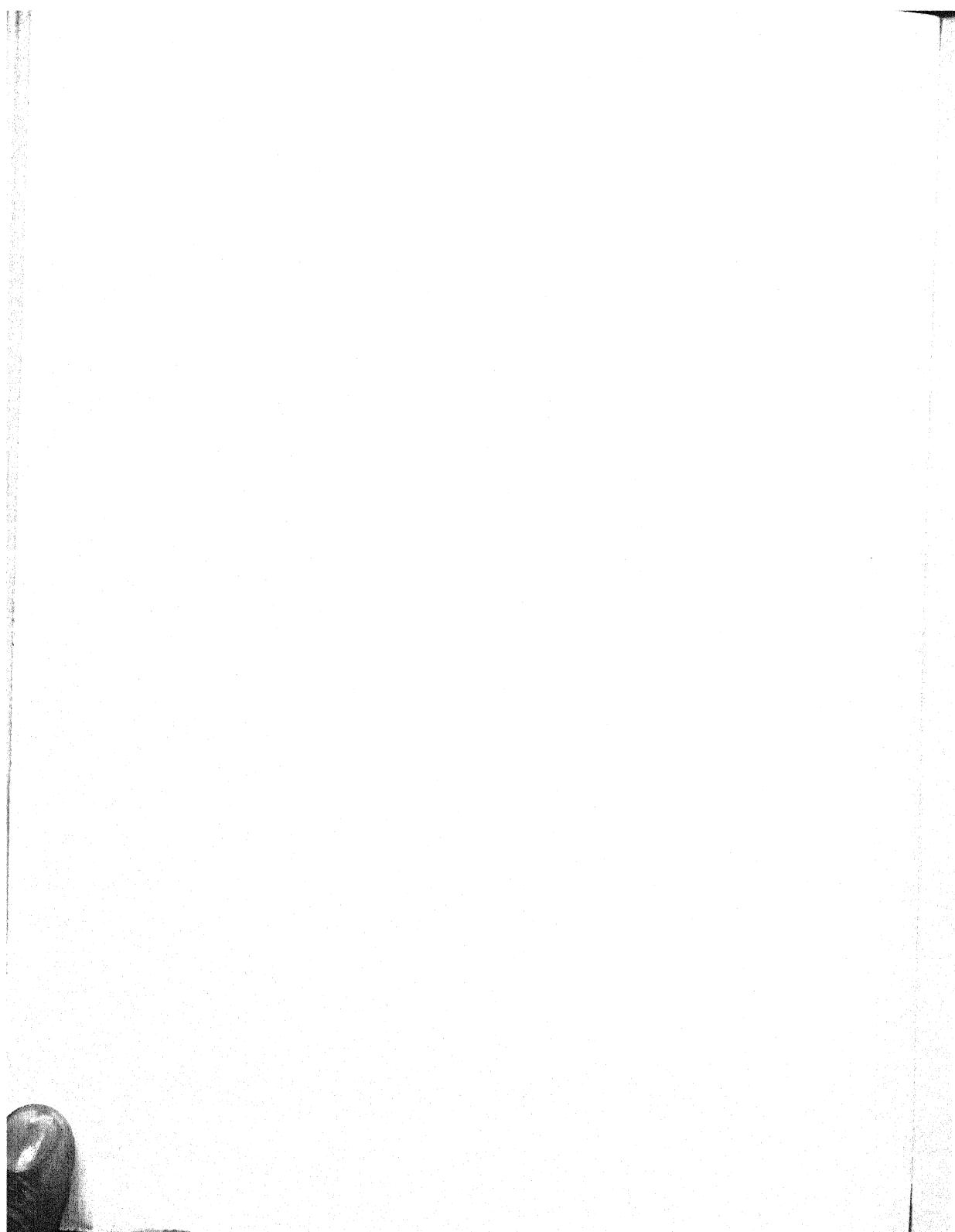


ENGLISH FOURTH-RATE.

Of the period 1740-45, when eight of these 50-gun men-of-war were built. Noticeable features are the jib-boom for the triangular headsail, and the retention of the lateen yard on the mizzen.

(See frontispiece for view of decorated stern.)

Model in Science Museum, South Kensington.



changes its shape, and instead of being triangular it becomes rectangular. That is not enough ; so now that part of the sail which was forward of the mast was cut off, leaving the fore part of the lateen yard still there barren of canvas. The sail on the after-part of this yard now takes on the shape of a fore-and-aft vessel's mainsail, the luff being laced to the mast without hoops, and vangs being used from the peak to the stern. There is for the present no boom to this sail. Thus, in a word, we are gradually making the sailing ship more handy, more able to go about, and more suited for working in company with other ships in a fleet or squadron. Hard war experience had demanded it ; and close study had shown that the warship existed for the gun, and not the gun for the warship.

The third change was in respect not of the sails, but of the steering arrangements. It is not possible definitely to give the date when the old-fashioned whipstaff method was abolished, and if that could be ascertained we should find that it was gradual rather than a sudden mutation. Of course, as these ships became bigger and tactics demanded better seamanship, the necessity for finer steering became manifest. All these seventeenth and eighteenth century voyages and fights emphasised this important point. Thus, by 1747, the steering-wheel was already used in the Royal Navy, and Hawke, in recording his action off Rochelle, refers to the *Eagle* "falling twice on board us, having had her wheel shot to pieces." In the mercantile ships the wheel was by 1777 regarded as an "excellent machine", and was becoming more adopted even in small ships ; but steering

THE SHIP UNDER SAIL

gear, according to Sutherland, was already in use by the year 1717.

As regards the decoration of ships, this had now become much simpler, and that fine Caroline and Jacobean ornateness was to yield. It was during the eighteenth and nineteenth centuries that the frigate, as a special class of ship for a special purpose, was developed and refined, till she became a fast sailer. She was what we should call to-day a light cruiser; not able to lie in line of battle, and therefore not a battle-ship. In the case of the last mentioned we omitted to say that the jib-boom was now used, projecting beyond where the sprit topmast had joined the bowsprit. Thus, instead of the old "boltsprit" existing, as it had done originally, for supporting the forestay, it is now of more use. It had begun by being a kind of mast, but its utility was extended when triangular headsails were adopted by big ships; and we all know that without it no nineteenth-century full-rigged ship could have set all those headsails.

The cro'jack, or more correctly "cross-jack," yard below the mizzen topsail will have been noticed by anyone who has studied the subject of ship rigs thus far. It had been in use since the beginning of the seventeenth century in fore-and-aft craft, but as no sail was set, it was known on the Continent as the "vergue sec"—the "barren yard." It was not till about 1840 that it occurred to seamen that it would be a good idea to set a sail along this barren yard, and so it was that the cro'jack sail came in.

The oak of those famous eighteenth-century wooden walls, which helped to win for Great Britain her maritime

EIGHTEENTH-CENTURY RIGS

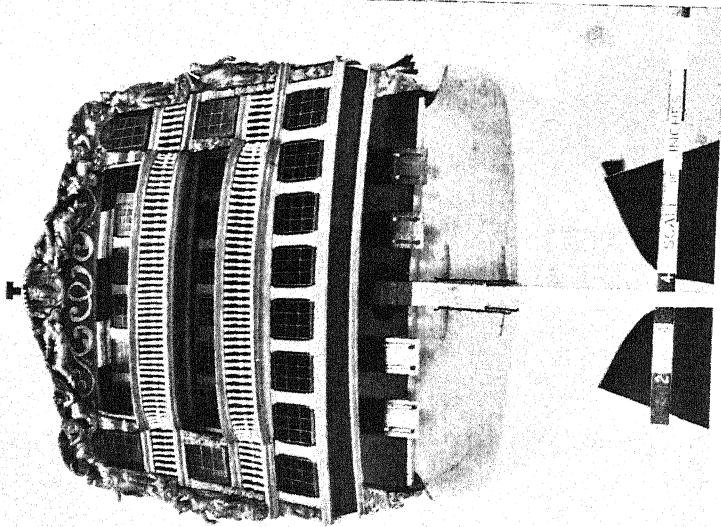
and colonial supremacy, was obtained normally from the Forest of Dean, Gloucestershire, and from the New Forest in Hampshire. Most yachtsmen are familiar with the old docks which still survive at Buckler's Hard, up the river Beaulieu. In those days it was customary to build wooden ships, not under a shed, but out in the open, where the weather got into them, and did such an enormous amount of damage, that sometimes a man-of-war had to be condemned before she was ever commissioned. Nelson's famous *Victory* belongs to this century, having been built in 1765, and thus we are able to get a connecting link with a period that in our own mechanical age seems strangely distant. Originally this vessel carried that old-fashioned lateen yard for her mizzen sail, part of the yard coming forward of the mizzen mast, just as had been the custom in the ships of Columbus, though of course the cut of *Victory's* canvas was as we have already clearly shown. But even if that lateen yard has long since gone, it is at least worth while to remember that an age of submarines and airships can still link itself to a vessel not altogether unconnected with the fifteenth-century ship practice. Regarded in quite another way, the *Victory* comes before our eyes as a three-decked 100-gun ship, the full expression of the sailing ship that was able to lie in line of battle, as distinct from the lighter frigate or corvette.

But if the *Victory* was of 2,164 tons, we must not assume that this was the normal size of an eighteenth-century vessel. It is clear, for instance, from Lloyd's Register of Shipping, that from 1764—the year before the *Victory* was built—down to the end of that century most of the British

merchantmen were not more than of 300 tons. At the beginning of that period our Mercantile Marine consisted of over 3,000 craft, armed with over 5,000 guns. But when war broke out with France in 1793 Great Britain owned over 16,000 merchant vessels. It was, therefore, amazing how much seafaring had developed in less than a hundred years.

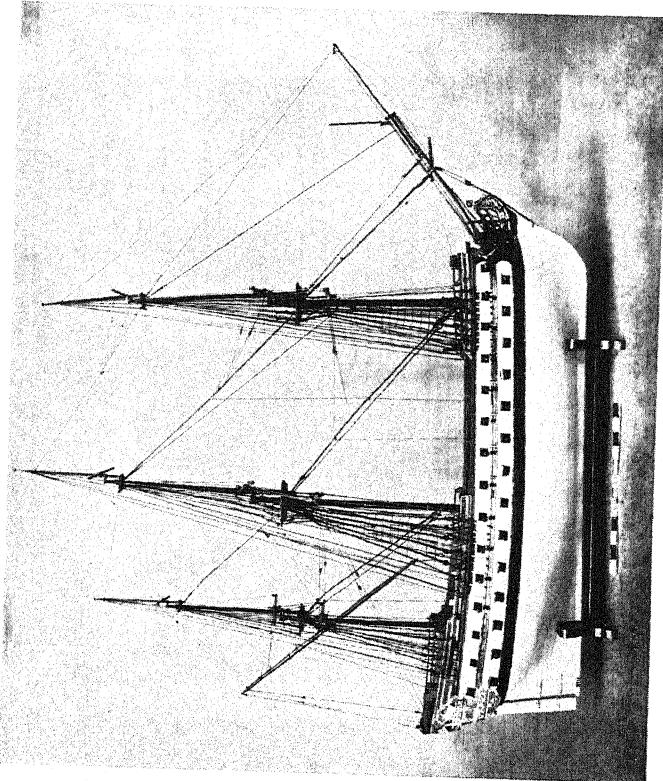
In 1761 experiments were being made to find a more suitable method of sheathing ships' bottoms, and copper now came into use in preference to lead. What progress was being made in the old East Indiamen we shall see from the following chapter ; but broadly speaking, if you omit from any eighteenth-century list the ships of the Royal Navy and the Honourable East India Company you have taken most of the craft worth having. It is, however, true that the Falmouth post office packet service had begun as far back as the year 1688, and during the eighteenth century it maintained an essential connection with Spain, the West Indies, and even the Southern States of North America. These merchantmen had to fight, on their passage, with Spaniards and Frenchmen. They were strictly forbidden to seek out an engagement, inasmuch as their primary duty was the safe carrying of mails ; but nothing could prevent these hardy mariners from a scrap, if they believed that there was a reasonable chance of obtaining a prize at sea.

Contrary also to regulations, these Falmouth packet-ships carried cargoes, and also did a nice little trade in smuggling. But let this one great fact be remembered to the honour of those ships and their crews : whatever the wind and weather might be, provided the packet ship could



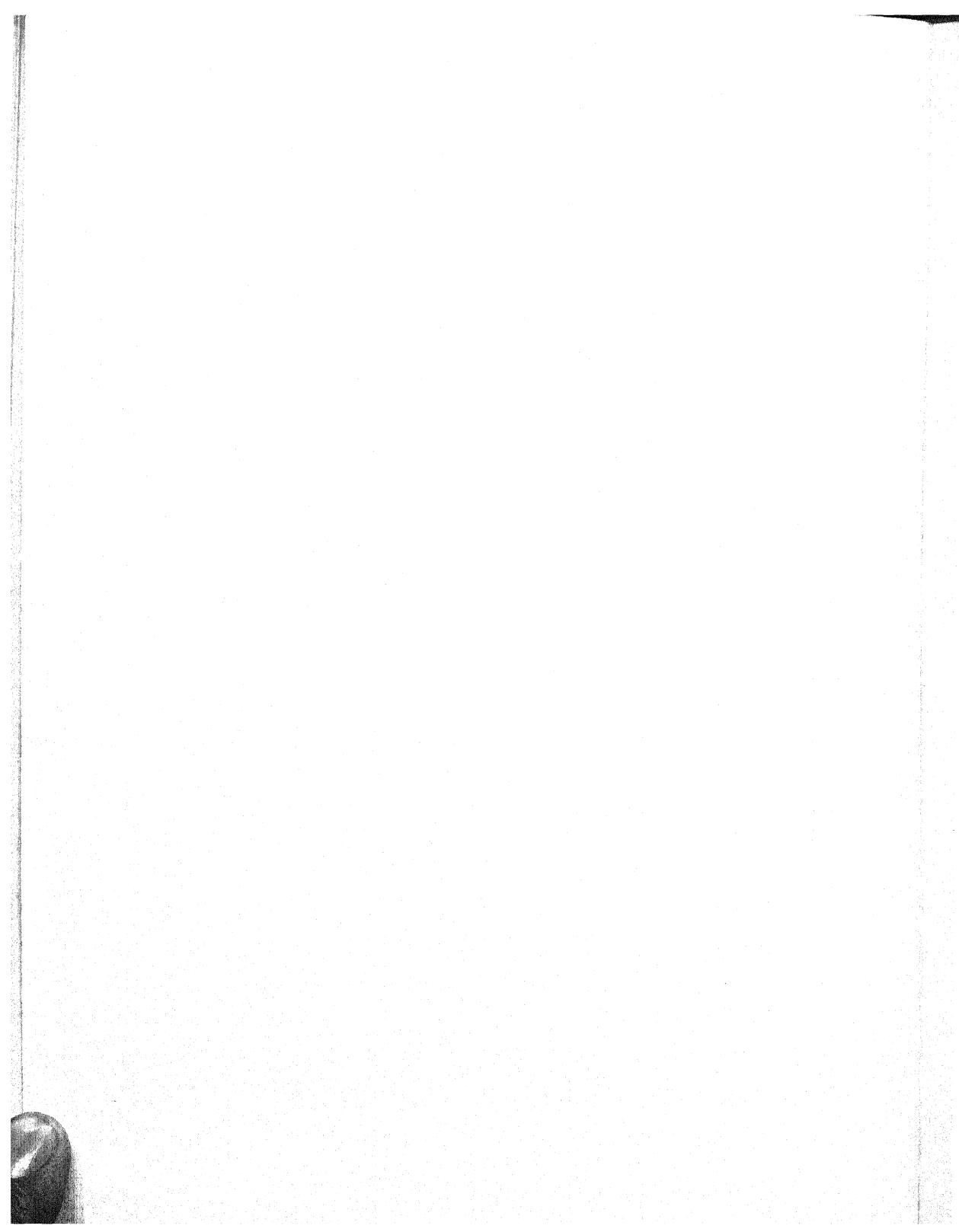
H.M.S. ROYAL.

Showing stern of a three-decked line-of-battle ship built at Woolwich in 1730.
She was a second-rate, carrying 98 guns, and of 2,010 tons burthen.
(Model in Science Museum, South Kensington.)



FRENCH LINE-OF-BATTLE SHIP.

This represents *Le Scopre*, one of the 74-gun French warships which took part in the war of 1788-82. She was of 1,882 tons, and had a complement of 680 men.
(Model in Science Museum, South Kensington.)



EIGHTEENTH-CENTURY RIGS

stagger along under a double-reefed topsail, it was a rule that the vessel should put to sea immediately the mails had been received aboard. And this regulation was strictly obeyed. By the end of that century there were sixteen of these West Indian packet ships; but so much did the Atlantic trade increase that this number had jumped to thirty-nine by the year 1808. These, then, were the American "liners" of the day, for the famous American packets of the Black Ball Line, running from New York to Liverpool, did not come along until the year 1816.

At the same time we must not omit to call attention to those fine little collier brigs and coasters, since in these craft were seamen who were veritable artists in their own particular sphere. For handling craft in narrow channels they were unique, and were comparable to the East India-men's sailors, whose genius was displayed in open sea. But no seamen could get so much out of a brig, as those crews which used to bring the coal from the Tyne to the Thames, before the introduction of steamships. The men were paid, not weekly or monthly, but by the voyage; there was every reason, therefore, why they should make the quickest passage. In these craft the mainmast was farther aft than usual, and this of course made them hard-mouthed. It was customary, accordingly, to use their spritsail and all headsail when beating to windward. The fore sheet in a hard breeze was got in by the capstan when beating through narrow channels. These little brigs had short main bowlines, and the main braces led forward, so that the main and maintop bowlines were hauled and belayed on the same pin.

Hundreds of these collier-brigs used to sail between Tyne and Thames with indifferent charts, threading their way between the North Sea shoals, and yet there were very few shipwrecks : so few, indeed, that they were very rarely insured. Sometimes as many as three hundred would be seen all turning to windward—surely one of the handsomest sights that ever the North Sea witnessed. And every one of these would have come out of the Tyne on the same tide ! Well may we regret that mechanical power has robbed the sea of so much beauty and romance. To have watched the Brixham fleet tacking down the English Channel in a fine breeze is something that certain of us may one day look back on with unique pride. But in the eighteenth century the living picture of this enormous fleet of colliers crossing and recrossing each other's bows, so deftly and quietly, showed the triumph of that seaman's art which is beyond all praise. It was in such craft that Cook, the great explorer, and many another fine sailor-man, learned the rudiments of his calling : and thus these coasters certainly contributed handsomely to the development of the world. It was a Frenchman who was so impressed by the sight of these plucky little brigs beating to windward in such numbers, and coming about with such ease, that he held up his hands and remarked : “It is there that France is conquered.”

CHAPTER X

EAST INDIAMEN

THE story of the Honourable East India Company is that of the most powerful monopoly in the whole romance of sea trading. And if its very nature precluded healthy competition and therefore improvement and development, at least it placed the Mercantile Marine on a very sure foundation. It encouraged builders to construct ships of such size and such strength, because there was no need for economy so much as good honest reliability in hull and everything else.

By 1681 the Company's fleet had become so prosperous that it owned about thirty-five ships of 100 to 775 tons; and between 1682 and the next seven years, as many as sixteen East Indiamen of 900 to 1,300 tons were built. And because of the French men-of-war and the privateers likely to be met with at sea, these merchantmen had to be armed powerfully. The outward cargoes of lead, tin, cloth, and stuffs, and the inward freights of raw silk, pepper, and other costly goods, necessitated this. Moreover, it was the only means of transport for the military, and those going out to serve ashore under the Company.

Thus the ships of this rich corporation not merely did an unlimited amount of good in building up the wealth of the British Empire, in developing and strengthening the

THE SHIP UNDER SAIL

Mercantile Marine ; but they were really a navy and marine of their own. And what Portsmouth has been historically to His Majesty's service, Blackwall for three hundred years was for the merchant ships. Here those fine vessels were built and launched ; from here they set forth to the Orient. You might call it the cradle of the big sea-trader ; for certainly from the year 1582 until the coming of the clipper, sailing ships continued to be fitted out and sent forth round the Cape of Good Hope.

But the connection between the Royal Navy and the Honourable Company's ships, in the eighteenth century was a very close one : the strong and dividing line between men-of-war and commercial craft did not then exist. During about forty years, the Blackwall shipwrights had to be employed largely in building vessels for the Senior Service ; since there were very small periods of peace between 1775 and 1815. And if we would get a fair idea of these eighteenth century traders, which were the beauty of our Marine, we must think of them, not as the later and faster clippers, but rather as the slow and stately sailers owned by a corporation which thought not a little of its dignity and unique prerogatives. Indeed, it is hard to find a more perfect expression of eighteenth-century English pomp and ceremony, solidity and conservatism, than in these frigate-built, indifferently designed but massive craft, which kept secure the connection between India and the mother-country. Such an East Indiaman as the *Falmouth* represents the type of the mid-eighteenth century. Three-masted, full-rigged, of 668 tons burthen, measuring 108 ft. 9 in.

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on the keel, with a beam of 34 ft., she carried topsails and t'gallants. She had a large figurehead, and that somewhat wasteful but ornate design at bow and stern was characteristic. There was an immense pride of ship and the company was rich ; so why not give her of the best ?

The modern steamship company usually owns its vessels ; but the Honourable East India Company used to charter these craft practically from the day they were finished ready for sea until they ceased to be seaworthy. At Blackwall in those days there was a unique colony of people dependent on seafaring and shipbuilding. Here were the homes of the crews' families, here dwelt the shipwrights, and here vessels were laid up or fitted out. You would have seen the ships lying in tiers—a wonderful exhibition of what overseas trade to the Orient can mean to the nation. Sometimes there were as many as five of the biggest East Indiamen on the Blackwall slips at one time. And it was because of all this congestion and the need for a safe, ample dock for this increasing fleet, that in 1789 the Brunswick Basin was begun in the east end of the Blackwall yard.

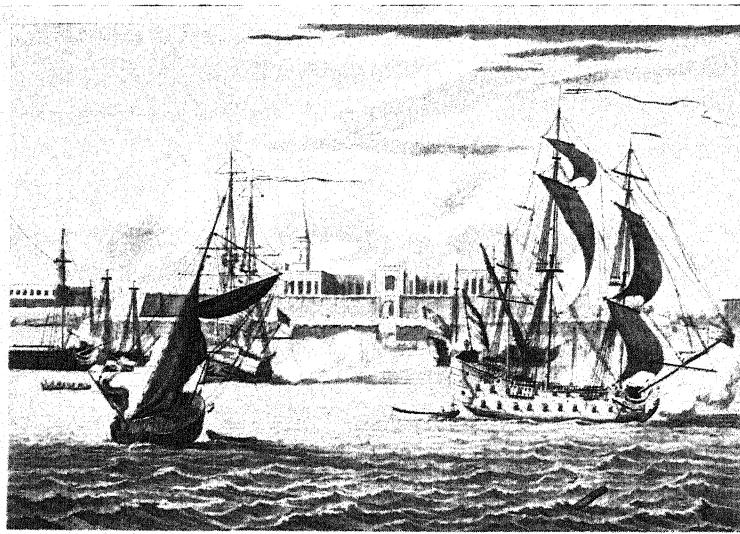
Built especially for the Company's use, it could accommodate sixty fine ships ; and, as we know from a contemporary print, a wonderful sight it was to see these craft packed tightly alongside each other. Those were the days when shipwrights and riggers and blockmakers were veritable artists. In this dock you could have seen some very smart work in handling spars without the modern mechanical appliances. There is on record that fine achievement when

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the *Lord Macartney* here alongside the quay had her bowsprit, as well as all her masts, raised and fixed in the remarkable time of three hours and forty minutes.

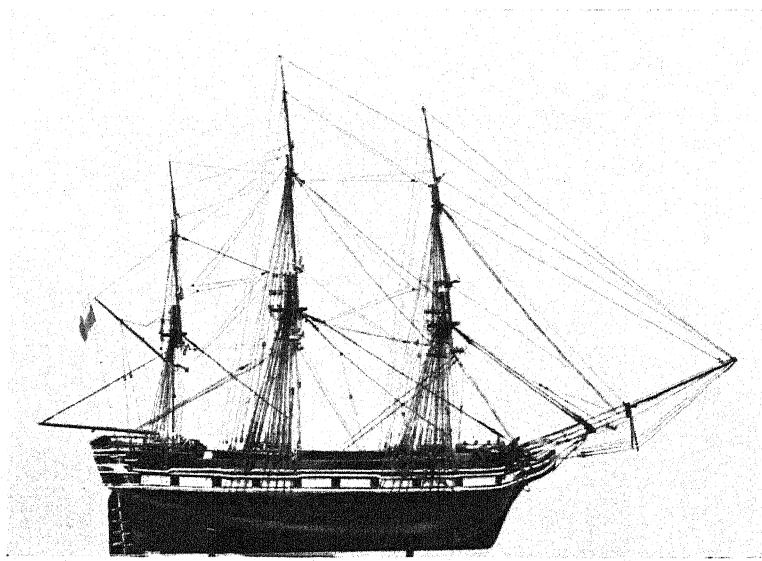
In the nineteenth century there were few better known names in the sailing ship world than those of Wigram and Green : there are still alive officers who served in such owned vessels. Now the first mention of the former shipping family comes in 1764 with Robert Wigram, whose father had been master of a privateer. After his death, Robert served for a time in the East India Company's ships, then became a merchant and one of the proprietors of the historic Blackwall yard, his son William becoming one of the Honourable Company's directors. Now to that yard in 1782 was apprenticed George Green, who was destined eventually to rise to the position of partner. Robert Wigram had once served in the Indiaman *Admiral Watson*, and it was in this self-same ship that he formed a friendship with the second officer, whose name was Money. We thus see the beginning of that association of Money, Wigram, and Green, which will be remembered as long as the nineteenth century sailing ships are held in veneration.

Some of these later East Indiamen were quite large craft for that period. In 1789, for instance, was launched the *Bombay Castle* from the Blackwall yard. She was a vessel of 1,612 tons, and armed with actually seventy-four guns ! For mutual safety and protection, these vessels would sail during strenuous times of war in powerful squadrons ; sometimes even as a fleet. For there is that unforgettable incident of the early part of the year 1804, when sixteen



Fort William at Hugli

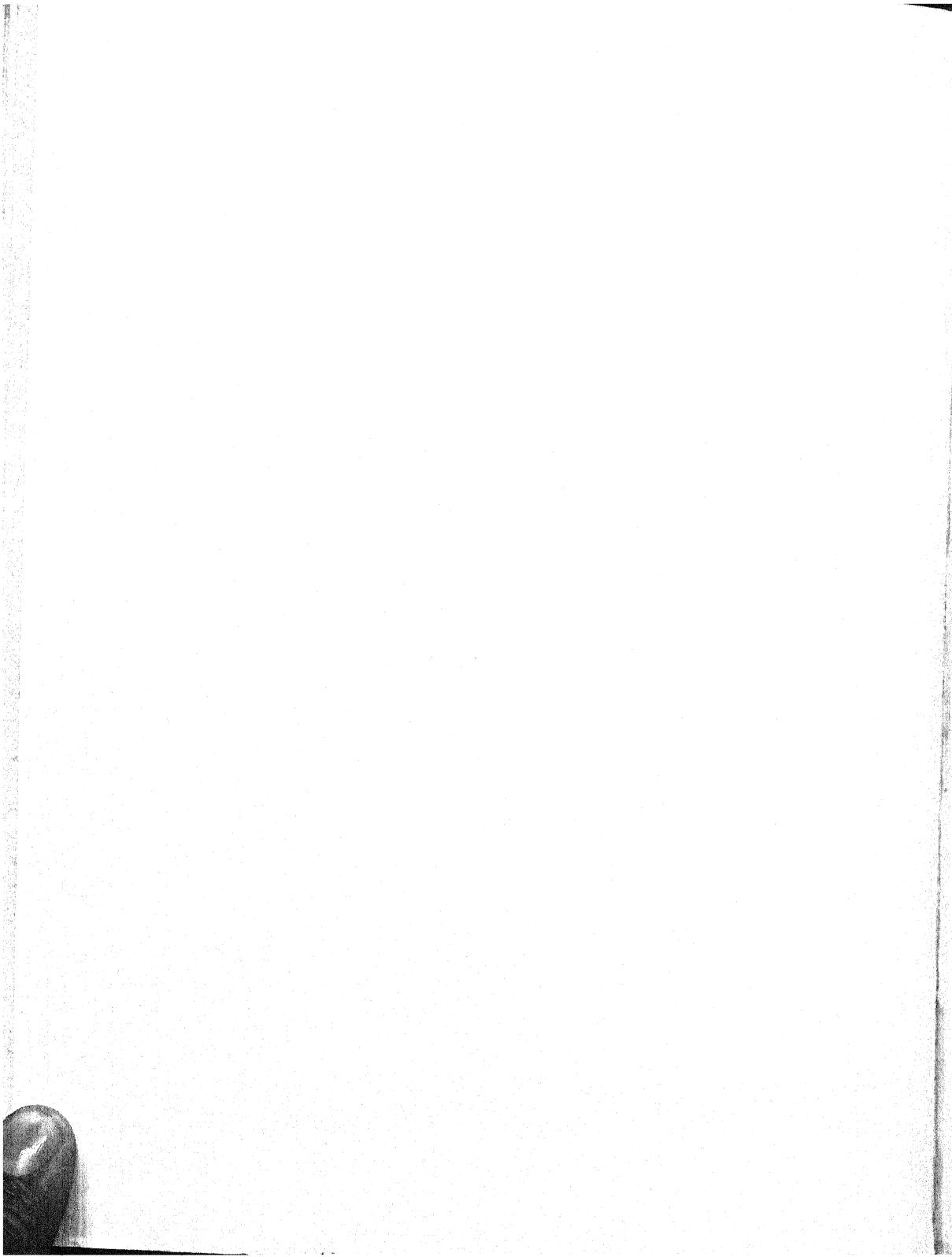
ENGLISH EAST INDIAMAN.
Off Fort William, Bengal, 1756.
(From a print by G. Vandergucht.)



ENGLISH EAST INDIAMAN.

Pierced for 20 guns on the main deck and for 14 on the upper deck, this represents one of the H.E.I. Co.'s early nineteenth-century vessels of 830 tons. Length of keel, 144 feet; beam, 36·75 feet; depth of hold, 14 feet. Complement, 60 men.

(Model in Science Museum, South Kensington.)



handsome East Indiamen set sail from Canton to Europe. Sixteen stately ships, none of them smaller than 1,200 tons and none of them bigger than 1,500 tons! With massive hulls and heavy sterns, ornate figure-heads and painted ports, most of them carrying royals and staysails; what a sight for any one with a love of the beautiful! The senior officer was that fine mercantile sailor, Captain Nathaniel Dance. But presently this convoy was increased by another large squadron. For a whole fortnight Commodore Dance handled this fleet under difficulties which those officers will appreciate who had anything to do with convoy work during the recent Great War.

And then, at length, a French man-of-war squadron under Admiral Linois was sighted, and there followed an engagement so fierce that the Frenchmen had to break away and make off to the eastward under all sail, pursued by the merchantmen. Thus, the East Indiamen by their gallant determination surprised the French admiral. He wondered indeed whether the sixteen East Indiamen, so smart in appearance and manœuvring, each with thirty to thirty-six guns, yet full of cargo and with decks lumbered, were not British men-of-war escorting the other vessels.

From a contemporary manuscript kindly sent to me by the great-grandson of an East Indiaman's commanding officer, who joined as midshipman in 1763, and served till the beginning of the nineteenth century, I am able to note every sail that was set aboard the *Essex* in the year 1816. These sails number sixty-four! They include royals, sky-sails, moonrakers, cloudscrapers, and star-gazers on the

foremast, and even sprit topsails on the bowsprit and upper t'gallant stun'sls on the main ; and such fancy canvas as ringtail, watersail, and mizzen royal staysail on the mizzen.

The standardisation of these East Indiamen is well shown by examining the lists and dimensions. Thus, at the close of the eighteenth century I find no fewer than fifteen of them all 144 ft. in length, and either 43 ft. or 43 ft. 6 in. in beam. The biggest ships then measured 149 ft. long, 43 ft. 6 in. beam, 1,502 burthen tonnage, 1,200 chartered tonnage. The smallest vessel in the list was the *Princess Mary*, of 643 burthen tons. It was always reckoned that an 800-ton ship would be able to bring to England 750,000 lb. of tea. And the increasing use of this beverage during the eighteenth century was to make the Indiamen even more essential ships than before. I have no wish to bore the reader with figures, but by the year 1765 the Company brought home and sold 5,000,000 lb. of this commodity ; and before that century was out this had been raised to 24,000,000 lb.

We have called the East Indiamen conservative. Well, let us examine an instance of this. In order to understand it, we have to get at the minds of the people in control. Now the second half of the eighteenth century was morally just about as slack as any period in English history. It is noticeable that between the years 1748 and 1772 all the Company's ships are with few exceptions of one curious size—499 tons. What on earth has this fact to do with morals ? Well, the answer is simple. It was a regulation that vessels of 500 tons and over were to carry a chaplain.

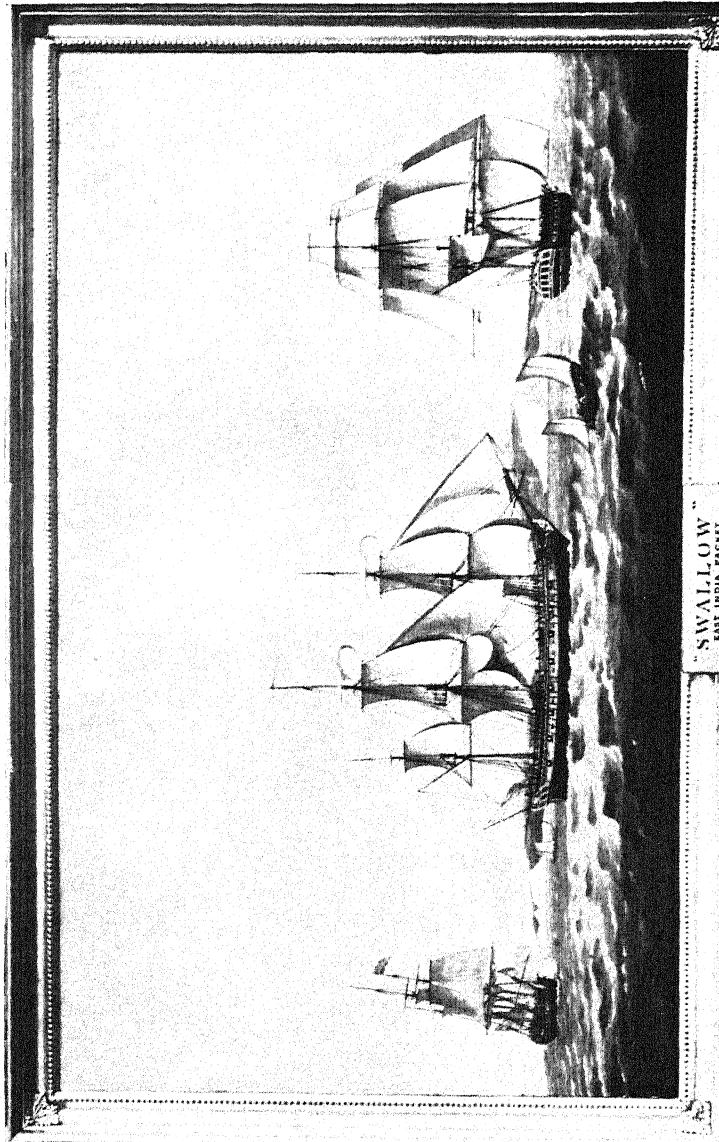
In order to cheat this rule and save expense, vessels were rated at 499 tons. In these ships were carried a captain, four mates, a surgeon, and purser. They would sail from the Thames in the spring of one year, and be back in the London river by about July of the year following. Outward bound, they waited a while in the Downs for passengers: inward bound, they landed the more wealthy passengers at Portsmouth, others landed whilst the ship was in the Downs, and then she came up the river and secured to moorings either at Blackwall, Deptford, or Northfleet.

A further instance of the tricky way they managed monopolies in those days may be cited in connection with what were known as "hereditary bottoms." This was a custom enabling an owner, who had been wont to charter one of his ships to the Company, to continue a proprietary right for supplying other ships after this one had ceased to be seaworthy. The *Brunswick*, for example, was built on the bottom of the *Atlas*. This practice went on till just before the century's close. Competition now was introduced, for whenever the Company required more ships to be built, they were ordered by Act of Parliament to invite publicly tenders by advertisement, four weeks previously. This, of course, was to make for increased efficiency so soon as the innovation got going. By the year 1810 there was a marked improvement in the class of this corporation's ships.

Another abuse was the sale of commands. To be captain of one of these ships was a much-coveted and lucrative job, but in order to obtain officers of "acknow-

ledged character, talents, and experience," this matter had to be remedied in the only possible way. Some idea of the fortune which could be made by a commanding officer may be realised from the following plain facts. He was allowed to engage extensively in the Eastern trade, he was allowed also a certain amount of free space for carrying such commodities on board. In addition, he further received passage-money from the Company's officials who travelled between England and India. Thus, he was reckoned an unlucky man if in five voyages as commanding officer he had not made about £20,000, though sometimes he made over £6,000 a voyage. All this was earned honestly. But besides this, as I know well from examining many unpublished documents, these ships were notorious smugglers from the captain downwards. There were all sorts of ways for deceiving the Revenue craft and officials, one favourite method being for local open-boats to come along the seaward side of the ship as she passed such places as Dungeness and Deal, where the goods could be dropped quietly into the bottom of the boats. In regard to smuggling on a large scale, Lindsay mentions the case of one commanding officer who in one round voyage, London-India-China-London, made £30,000. And if we consider the superior purchasing power of money in those days we can hardly wonder at the popularity of the service in these ships.

The hands were drilled as in the Royal Navy, there were courts-martial held on board, and strict discipline; the service attracted the ablest seamen with good prospects, good food, and plenty of grog. Built more or less navy fashion,



By Permission

ENGLISH EAST INDIAMAN SWALLOW.
OF THE PRINCE OF WALES AND ORIENT STEAM NAVIGATION CO.

This picture, painted in 1788, shows one of the H.E.I. Co.'s ships of about 700 tons burthen and 18 guns. She is seen in three positions: (a) Hove-to for a pilot, (b) under plain sail, (c) before the wind under stunsails and all sail.

(In Science Museum, South Kensington.)



EAST INDIAMEN

these East Indiamen frigates were fuller-bodied in order to carry much cargo, and safety first was the method of their voyaging ; speed was not a consideration. Before darkness they took in their royals, stun'sl, and fine weather canvas, and when bad weather was coming on they stowed t'gallant sails and mainsail, even reefing topsails.

During those first thirty years of the nineteenth century, just before the Company were to lose their Indian monopoly, their ships were at their best. The expression " Merchant Service " belonged exclusively to the East Indiamen, in order to distinguish the service from the Free Traders and the Royal Navy. Indeed, as we know from contemporary memoirs, to get a youngster into the Company's service was just about as good as obtaining for him a commission in the Navy. It was in 1834 that this historical association lost its China monopoly ; and then a new era, with the fullest competition, came into British shipping. The Greens and Wigrams were building ships for themselves ; but now Blackwall was to have a new rival in the Tyne, where T. and W. Smith not merely were building East Indiamen, but owning them and running in competition with the Blackwallers. And there was competition even on the Thames ; for the Green fleet now strove against a Wigram fleet, and by 1843 that old partnership had come to an end.

But the traditions and customs of the Honourable Company were a long time dying, for they were largely carried on by the new owners and new crews. Some of the captains, officers, and men, had been taken on by the new

regime ; so had some of the ships, such as the *Earl of Balcarres*, *Thames*, *Lady Melville*, *Buckinghamshire*, which had now been bought for sums varying from £4,000 to £10,700. The first mentioned had been so solidly built that she served for over fifty years. But not more than a fifth of the old personnel changed over, and the reason was that private owners competing could not quite fancy officers and men who had been wont to serve in ships run regardless of expense. And the officers themselves largely considered it beneath their dignity to go afloat in "free traders," and to forfeit many of those emoluments which had long since become customary.

The first of those famous Blackwall frigates, directly descended from the defunct Honourable Company, was the *Seringapatam*, launched in 1837 : the last was the *Melbourne* (built at Green's Blackwall yard), and launched in 1875. Many readers will remember this fine ship under the name of the *Macquarie*. The Blackwall frigates were high class ships, with high class crews, run in a high class manner. Officers were from the same families which had given the eldest son to the Royal Navy ; there were no apprentices but midshipmen, whose parents paid a premium of £60 a voyage. Much of the old dignity and almost naval routine continued. No officer or man dared address on duty his superior without saluting. We are speaking now of about the year 1860, when these Blackwallers still carried a few guns on the main deck ; and with their painted ports, square yards, and great whole topsails could be taken for one of the old frigates save for the house flag flying at

the main. In the old pictures, the Blackwallers are seen with high bulwarks and heavy sterns, which give them an unnecessarily heavy appearance.

For they really had fine lines under water, and in hard winds these vessels could and did hold their own against the celebrated clippers of the 'sixties. All sorts of dodges were employed aboard the Blackwallers in such races, in order to coax another fraction of a knot speed. Thus the lee cable would be got out of the chain locker and ranged along the weather deck ; or the Fourth Mate would send the men to pump fresh water out of the lee tanks into those on the weather side ; or in light winds, the hose would be taken aloft to wet the sails, that the canvas might set the better. All who served in these ships were very conscious of their superiority to the contemporary vessels sailing out of Liverpool, as being less polished and not wearing an honoured uniform. How matters have changed since those days ! How the Thames has yielded its pride of place as the port of the biggest ships and ship-builders !

The reader who has followed these chapters will remember that spritsail, which had centuries ago been set below the bowsprit. In the nineteenth century it was still used in ships but under the name of a "water-sail" or "bull-driver." Leslie says they were employed even on a wind, and the late Frank T. Bullen, who died not so long since and served at sea in the 'seventies, stated that this sail was not much used, and always had to be stowed as soon as the ship began to pitch. The reef-points were placed diagonally,

so that when the ship was heeling to leeward, that side of the sail nearest the sea was narrower than the windward side. These sails were known also as "Jimmy Greens," and there were cut two holes so that the water could run out and not split the canvas. In the very few sailing ships which were still afloat in 1914, the reader will remember to have seen along the hull imitation painted ports, and this, even though the ships were steel built. The origin and continuity of this may be mentioned here; for there are now not more than five British square-rigged ships in existence, and not much more than one hundred in the whole world, though the latter figures are being regularly reduced: so let us see how down to the very end, the grand old sailing ship maintained her conservatism long after she ceased to carry guns.

Until the beginning of the nineteenth century, ships of the Royal Navy were painted with blue upper works, bright yellow sides, and black strakes at the waterline. A few days before Trafalgar, Nelson's ships were painted thus: hull and port-lids black, with a yellow streak along each tier of ports. After Trafalgar, they used white instead of the yellow which Nelson had ordered. So, too, the East Indiamen painted their ships with a white ribbon round the hull, the ports being black. The custom continued in steamships for a time, as for example in Money Wigram's s.s. *Northumberland* built about 1871, and employed in the Australian trade. And the practice was seen in such a four-masted barque as the *Olive Bank*, built in 1892. But, of course, the list could be added to easily enough.

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Thus through the stately East Indiamen, the steel sailing ship kept up an old custom of the sea. And here we must leave one section of our subject which is so full of sentimental and historic interest, that we could continue till the reader's enthusiasm was strained to breaking point.

CHAPTER XI

CLIPPER SHIP DAYS

WITH the coming of the clipper ship period commences the golden age of the sailing ship. If the eighteenth century East Indiamen were slow but stately, the nineteenth century was to witness the development of handsome fast vessels of comparatively smaller carrying capacity. Progress and development demanded a speed greater than that which had satisfied our forefathers; and the influence of America now enters as a new factor, just as in the past we have noted how the Mediterraneans, the Vikings, the Spaniards, the Dutch, and the French all in turn taught so much to the English shipbuilders.

No ship type could be more different in hull than the old-fashioned East Indiamen was in comparison with the clipper. Instead of bluff dignity, we see evolve a slim craft which was as delicate as a piece of statuary, and needed just as careful handling. Now the origin was as follows. From North America, where timber was cheap and plentiful, and tradition did not prejudice shipbuilders' minds, had already been launched many an improved frigate and fast privateer. The first genuine clipper ship was the *Rainbow*, built in New York during the year 1845; a vessel with hollow lines at the bows and her extreme beam much farther aft

than had been the custom. This 750-ton ship became the fastest vessel in the world, but was lost three years later, probably off Cape Horn.

At this period, be it remembered, China was a great source of attraction to shipping; since there was a great demand for that pernicious drug opium, although ever since the year 1796 the Chinese Government had declared its importation illegal. British and American firms, to their eternal discredit, but with considerable gain, did however carry on this trade with China illicitly. Thus there was a demand for fast vessels which could both get the job done quickly, and hurry away from the speedy pirate lorchas. The opium merchants had receiving depot-ships in the four treaty ports, and it was the duty of the clippers to keep the depots well supplied, returning with silver dollars or bullion.

That was one incentive which sent clippers to Chinese waters. The second was in order to bring home from there the China tea. Already in the last chapter we have noted how increasing was the tea-drinking habit during the eighteenth century. But, as soon as the Honourable East India Company lost their China monopoly, the demand for fast ships to carry the Oriental trade was to exert a great influence on contemporary craft. In the year 1846 was launched in New York the *Sea Witch*, 890 tons, which made such splendid voyages to China and back that her best day's run of 358 miles was far ahead of anything which a steamer of that date could accomplish. The American China trade was considerable, so that in one

year forty-one ships with tea, silk, and spices came across to New York ; and certainly these American clippers were the fastest ships of their time. Why was this ?

Well, if the East India Company's monopoly and the long series of English Navigation Laws did everything to preserve a kind of protective isolation for our overseas trade, these twin influences unquestionably killed all ship enterprise and inventiveness. From 1651 to 1849 the Navigation Laws of this country had the effect of keeping out competition ; but now, after that period of self-complacency had passed and the first American tea-carrying ship to reach England from China arrived in the London river in the autumn of 1850, the Blackwall builders received a violent shock. This American had come from China in ninety-seven days : the fastest passage yet. And when they began to examine her lines in the Blackwall dock she was a veritable eye-opener to those who had been accustomed to East Indiamen. The ship's name was the *Oriental*, and presently the first two British tea-clippers *Stornoway* and *Chrysolite* were built at Aberdeen largely owing to the American's design. The latter went out to Hong-Kong in 102 days, and came home to Liverpool in 103 days. There followed a keen competitive spirit now against the American-built ships, and in 1852 Richard Green built the famous tea-clipper *Challenger* which beat the American *Challenge* in the race from Anjer to London by a couple of days. But the keen determination to get the tea home to its port quickly was such that there grew up intense rivalry between ship and ship of the same

CLIPPER SHIP DAYS

nationality; and thus the arts of shipbuilding, rigging, seamanship began to reach such a state of excellence as had never been previously attained.

But there were three other causes for the subsequent encouragement which the clipper-ships received. We have mentioned the opium and tea in regard to China, but in 1849 came the discovery of gold in California. San Francisco was a mere village, and then all of a sudden everyone from the Atlantic side of North America wanted to get to the Pacific, and to get there quickly. Owing to the difficulties of land travel, here was a first-rate demand for the American clipper. So many people wished to get rich in a hurry that these vessels were turned out in large numbers: within four years 160 of them were launched. They used to sail from New York to 'Frisco in 100 to 120 days. This migration west did a great deal for the American clipper, and in that first year 90,000 passengers were thus brought by sea. But then, just a couple of years later, came the discovery of gold in Australia, and for the next three or four years there were about 400,000 people to be transported in British-owned ships.

Now, inasmuch as American shipbuilders possessed such expert knowledge in clippers, orders were placed in North America for new ships. Thus the *Marco Polo* was built at St. John's, New Brunswick, for James Baines & Co. of Liverpool. She was of 1,622 tons, and was the first Australian clipper. This vessel sailed out of Liverpool in 1851 and got to Melbourne in sixty-eight days, which was a record, and became a very popular craft during that

southern gold rush. Twenty years before the White Star Line ever entered into Atlantic steamship competition they were owners of sailing vessels running out to Australia. Their famous *Red Jacket* was built in New England during 1854, crossed from New York to Liverpool in thirteen days and one hour, and in that her first year sailed from Liverpool to Melbourne in sixty-nine days. She was a fine craft of 2,006 tons, and used to beat this number of days easily. On at least one occasion she made an outward voyage to Port Philip Heads in sixty-four days ; but the reliability of her performance may be judged from the fact that she advertised she was under contract with H.M. Government to do the passage in sixty-eight days subject to a penalty. Thus the Australian clippers made a history of their own.

But the third impulse which the clippers received was from the increasing trade between England and North America, and on this route there was to be built up a large passenger business. Speed was an important factor, and these Atlantic clippers did carry on, the masters of such ships holding on to their kites till the last. And even when the early Atlantic steamers began to run, these clippers could beat them for speed.

There has been some little confusion over the word "clipper." During the 1850's there were clippers, half-clipper barques, and half-clipper ships. Topsail schooners could also be clippers, and indeed some of those on the China opium trade were thus rigged. But strictly speaking, only those full-rigged ships built on extreme lines for the

utmost speed were officially recognised as clippers by the American Lloyds' Registers; the other classes being sharp ships, medium ships, and full-bodied ships. Let us now consider some of these ships in greater detail.

An American clipper of about 1850, when sailing with the wind on the quarter, would set the following canvas, reckoning from forward to aft: flying jib, outer jib, inner jib; fore-course, lower foretopsail, upper ditto, single t'gallant, and fore-royal. On the mainmast were the mainsail, lower and upper topsails, single t'gallant, royal, and skysail. On the mizzen-mast were cro'jack, lower and upper topsails, single t'gallant and tiny royal. In addition to these were set stun'sls on fore and main, a driver abeam the mizzen-mast in addition to the staysails on main and mizzen. The cro'jack sail set on that "barren yard," alluded to in another chapter, was an innovation about the year 1840 by an American captain.

One of the most famous and most beautiful California clippers was the *Flying Cloud* of the year 1851. This was one of the fastest sailing ships ever built, and once, whilst on her voyage from New York to San Francisco, logged 427 miles in the twenty-four hours. Her dimensions are interesting: length 225 ft., beam 40 ft. 8 in., depth 21 ft. 6 in., tonnage 1,783. Her mainmast was 88 ft., her main-yard 82 ft. Three-masted, she had only a small, low fo'c'sle, but a long poop deck. Deck-houses were between the fore and main masts. She set skysails on all three masts, and both t'gallant and royal stuns'l's on the fore and main. This lovely ship was sold by Mr. Enoch Train

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whilst still on the stocks, and there were few greater regrets in his life than the fact that he did part with so fine a creation. If we have any imagination, we can think of the *Flying Cloud* in the Roaring Forties, or beating round the Horn, or leaping along the South-East Trades.

But the largest extreme clipper and the most wonderful that America ever built was Donald McKay's unforgettable *Great Republic*. She was remarkable in several ways, so we must study her carefully. This was the first vessel to carry double topsails, but these were not to become universal as a sudden prevailing practice. For the *Great Republic* was built in 1853, and in the celebrated picture of those famous tea-clippers *Ariel* and *Taeping* we still see a ship with one of those big single topsails on each of three masts though the other vessel has double topsails on all three masts, even in 1866. The *Great Republic* was a four-masted barque with skysails and stun'sls. One has to compare her with the cumbrous old East Indiamen of the Honourable Company in order to appreciate the sweetness of the clipper's lines. In another feature she was unique, too ; for she was the first vessel ever to have an engine for the exclusive purpose of hoisting the yards and working the pumps. And her size ! She was of 4,555 tons, 335 ft. long, beam 53 ft., depth 38 ft. There were 4,500 square yards of canvas, and her crew numbered 100. There were four decks and she was specially strengthened with iron lattice work.

The Australian gold rush was in full swing and the intention was to use her for that passenger trade ; but, sad

to relate, on the day after Christmas, just when she was almost ready for sea, she caught fire and had to be rebuilt. This brought her registered tonnage down to 3,357, but even then she was still the largest sailing vessel in the Merchant Service, and in February 1855 began her maiden voyage, sailing from Sandy Hook to Land's End in thirteen days. Later on she was chartered by the French Government to carry troops to the Crimea.

Another famous American extreme clipper was the *Nightingale*, whose beauty was as remarkable as her career was varied. Those who saw her at sea used to go into ecstasies over her, so slim and speedy was she. Her origin came about as follows. In that important year 1851 there arrived in America a young Swede wishing to build a sailing ship that would carry passengers across to England for the great Exhibition in Hyde Park, and for this purpose she was to have extensive cabin accommodation. The *Nightingale* was laid down at Eliot, Maine, New Hampshire; the hull was almost ready, the masts, spars, and canvas were being finished, the best possible material only had been employed, and she was to have been nicely ornamented with a richly carved and gilded rail—when suddenly the Swede ran short of money. This delayed matters considerably, yet she was eventually completed and launched that autumn, but sold by auction for less than half her cost.

The *Nightingale* was thus never used for her intended purpose, but in October 1851 made an undistinguished voyage from Boston to Sydney in ninety days. But when

she sailed from London to Sydney she beat every ship with the exception of that other flier, the American *Challenge*. In 1854, carrying 125 passengers, she made a fine trip from New York to Melbourne in 75 days, her best run being 365 nautical miles, though frequently she reeled off her sixteen knots during this voyage. If ever a vessel earned the money that was paid for her it was this ship. She carried gold-diggers to Australia, she raced home from China with tea, she afterwards became a slaver, later still served during the American Civil War in the Federal Navy, but presently as flagship of a telegraph company's fleet (which included steamships) in the North Pacific ; she then became a general trader, and finally ended up as a North Atlantic timber ship. Those were the days when, to use a well-known expression, ships were "well and faithfully built," and during her forty-two years of strenuous service she sailed every sea in the world between the Bering Sea and Cape Horn. More than this could not be expected of any wooden, sail-propelled vessel.

In this twentieth century there are still foolish, prejudiced people who sneer at history as at some useless science having no practical value in the progress of the world, but rather as a foolish waste of effort. Happily during the present generation, especially during the last twenty years, this attitude has begun to be dispersed, though gradually. One of the greatest benefits of history is that we are enabled to see facts as a whole, sanely, relatively, and not as unattached irrelative events. The present serious depression and critical state of the shipbuilding

trade, for instance, must be viewed in its right perspective. Eighty years ago this British industry was destined to go through a worse crisis than the present slump which set in after the Great War.

For during the 1840's the Americans, with their unlimited supplies of timber, were able to build ships far more cheaply than British firms, and just at that time when Blackwall was ceasing to have its monopoly. So great was that depression that in Sunderland alone, during the years 1841-7, no fewer than forty shipbuilders went bankrupt. Before long, however, all this anxiety was to be turned into considerable prosperity, and Great Britain was able to profit by the wholesome but rude shocks which America had given her. Many readers may recollect that some years ago a critic of the Royal Navy—it was long before the Great War, but he died only quite recently—agitated the public mind when he stated rather bluntly that what the service then suffered from was “too much Lord Nelson”: they had run a good idea too long. Well, without being an iconoclast, one may truthfully say that in spite of the great and vast benefit to nation and Empire which the Honourable East India Company unquestionably gave, shipbuilding did suffer for a long time from “too much” H.E.I.C. Just as we know that when slaves were first released they found it difficult to use their freedom; so the stereotyped British ships found it hard to get out of a fashion which had been controlled for so many years.

But now that the shock had done its good, and the

Blackwall tradition was limited, the Clyde began to build fine-lined tea-clippers and rise to a supremacy of its own. It was in 1855 that Steele of Greenock, who was to do so much for the sailing ship, launched his first tea-clipper, the *Kate Carnie*. Then followed such crack ships and record-smashers as the *Taeping*, *Serica*, *Ariel*, and *Sir Lancelot*. In 1865 a Glasgow firm built the famous three-masted *Taitsing*. But we have to realise that the tea-clippers carried a light cargo, that they were built for speed and not for size. Vessels of 815 tons, such as the *Taitsing* and others, all under 1,000 tons, seem quite small craft compared with such American clippers as the *Great Republic* and certain other craft.

Some of the most famous ships of this period were the *Antiope*, built in 1866; the *Lancing*, built in 1866; the *Cutty Sark* of 1869, and the *Hesperus* of 1874. The *Cutty Sark* is happily still afloat and being cared for. The *Lancing* has just finished her career, but I shall always be proud to have seen her in commission on that memorable day in October 1914, when I happened to be taking a patrol craft up the North Sea. There was this exquisite four-master with her black hull and white band and painted ports in accordance with the East Indiaman tradition, and that handsome light cruiser *H.M.S. Forward* a few cables off cleared for action. How this sailing ship escaped the North Sea minefields and German submarines, whilst that valuable cargo of nickel ore was bound for the Forth is one of those lucky affairs that sometimes do come to the deserving. She had then carried away her fore t'gallant-

CLIPPER SHIP DAYS

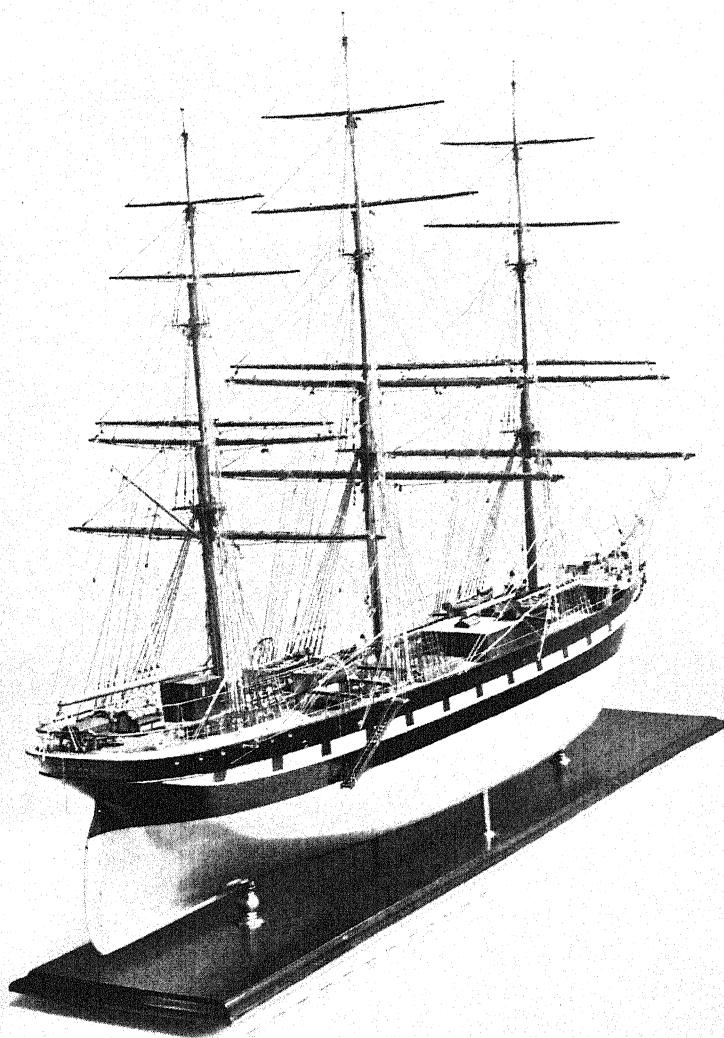
mast, but she was destined to complete just on sixty years of service before she closed her career.

The dying of these old ships and their contemporary seamen has happily aroused, at the very end, interesting controversies regarding the speeds of clippers. One has to be very careful therefore not to offend the susceptibilities of ancient shell-backs who still remember with pride the sights and scenes which most of us would have given everything to have witnessed during that age when seamanship rose to its pinnacle of perfection. But I think it cannot be controverted that the longest day's run ever made by a tea-clipper was *Cutty Sark*'s achievement of 363 miles. The longest day's run ever made by a sailing ship of any sort was that record of the Black Ball clipper *Lightning* which was launched in 1854. On the 1st of March, during her maiden voyage to Liverpool, she did definitely in the twenty-four hours' run 436 miles, and in doing so carried away her foretopsail and a jib. Several times the log was hove and she was found to be travelling through the water at eighteen or eighteen and a half knots. In this marvellous speed we see what could be done by ships and real sailor-men.

As to the *Cutty Sark*, there are various claims made by those who passed her at sea, but we have not room for more than one, and this the most recent. It is pleaded by one old mariner who was serving in the iron *Buckinghamshire*, a vessel of 1,465 tons register, that in 1878, when off the Portuguese coast, outward bound to Bombay, with a brisk breeze on the starboard quarter, the *Buckinghamshire*

passed the *Cutty Sark* about ten o'clock in the forenoon, both vessels steering the same course; and that same night the *Cutty Sark* was well astern, hull down.

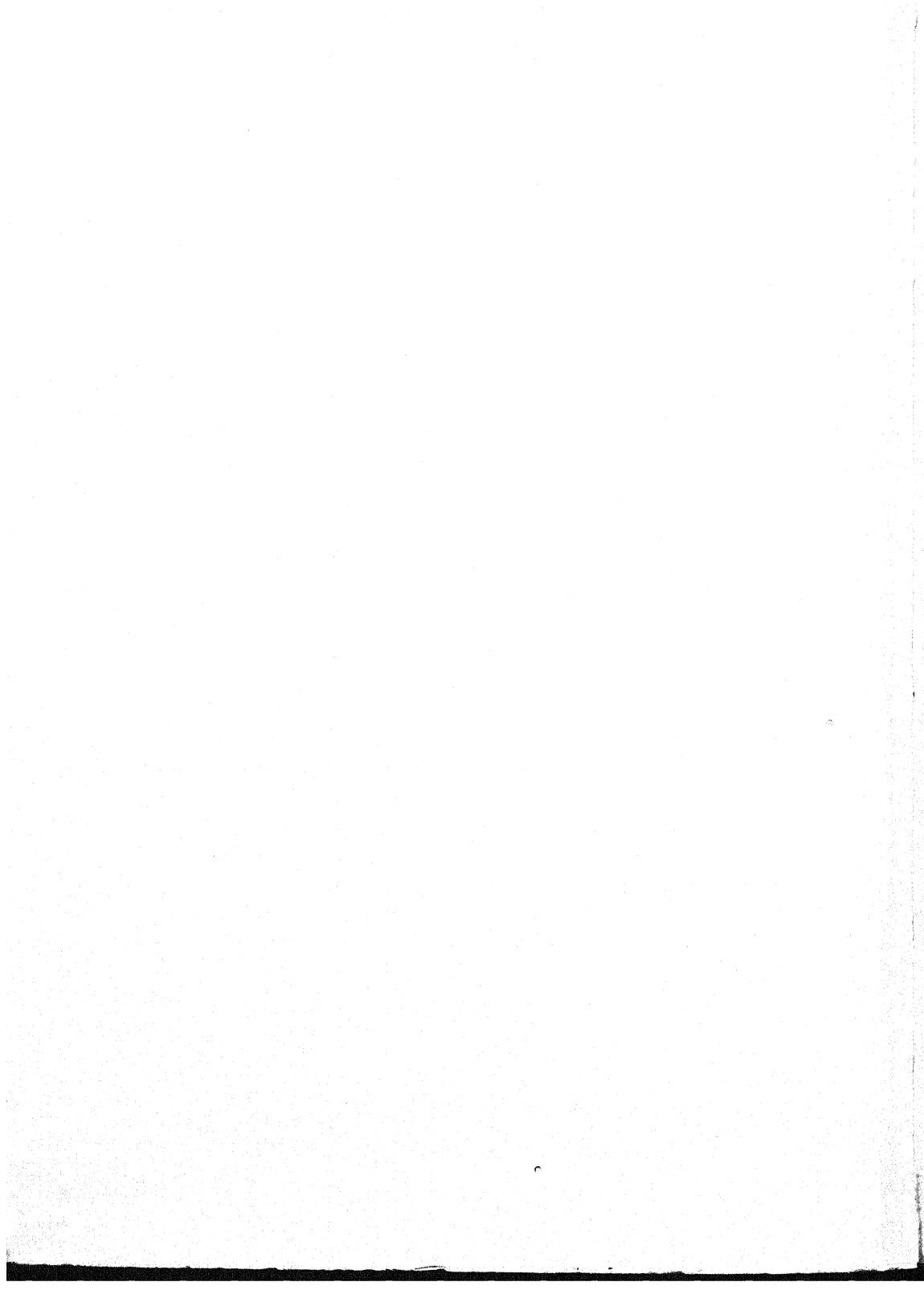
So the clipper ships form one of the most romantic chapters in our subject. They came and they have gone; but they have left behind an imperishable record of what was accomplished in that same century which followed the passing of the old East Indiamen. And the great tradition which links them up through the centuries right away to Elizabethan times is something of which we may be proud in a mechanical age that so soon tires of its latest clever invention and thinks nothing of sentimental inspiration.



FULL-RIGGED SHIP *SUDBOURN*.

Built of iron at Stockton-on-Tees in 1881, of 1,750 gross register tons. Length, 265 feet; beam, 39 feet; depth, 24-25 feet. Two steel decks; poop, 42 feet long; forecastle, 33 feet long.

(Model in Science Museum, South Kensington.)



CHAPTER XII

THE GLORY THAT WAS SAIL

SO much has been written about the London tea-clippers, so great has been the prestige of the Thames, that we must not forget that in the 'fifties and 'sixties Liverpool had its fleet of tea-clippers, and Aberdeen and the Clyde became famous for building some of the very finest sailing ships ever seen.

Among the Liverpool tea-clippers were such well-known vessels as the *Robin Hood*, the *Friar Tuck*, *Chaa-sze*, *Jessie Beazley*. The *Chaa-sze* was built at Aberdeen of teak frames and double planking, having been originally intended for a whaler. She was a craft of 556 tons. The *Vision*, another Liverpool ship, also Aberdeen-built, and of 563 tons, had even treble planking, and this tea-carrier once had a famous race home with the *Cairngorm*. The latter actually took the trouble to set a topmast stun'sl at the end of the jib-boom during this close contest, the tack being at the bowsprit cap, and the sheet led to the dolphin-striker, so that she was now carrying thirty sails to the *Vision*'s twenty-nine. But off the western approaches the two ships separated, the *Cairngorm* being bound up Channel for the Thames, the *Vision* up the Irish Sea for the Mersey.

But still, though out of sight on different courses, that great race, which had begun as far away as Borneo, still

continued. Both ships went cracking on, for it was the honour of Liverpool against the reputation of London : and there was that extra £1 per ton of tea to be paid to whichever ship got into dock first. Well, to cut the story short, *Vision* came tearing along past the Welsh coast, flew by Holyhead, but when off Great Orme's Head she was met by a Liverpool tug. And now Customs officers and clerks leapt aboard, the tug got hold of the tow-rope, hatches were removed, the *Vision* came up the Mersey into the dock, and with the utmost despatch the cargo was put ashore. Here a special train was waiting, and the result was that the *Vision*'s teas were on the London market actually twenty-four hours before the *Cairngorm* arrived in the Thames.

But it was the steamers of Mr. Alfred Holt which began to make the tea-clippers obsolete as a commercial proposition. The glory of those great seamanship days was to die slowly at first, but since 1914 the sailing ship has begun to disappear with rapidity. Before the war one used to see at anchor in Falmouth as many as a dozen full-rigged ships or barques at a time. Even during the war, those of us who were patrolling in the western approaches saw quite a few of these as they made the land in the neighbourhood of Mizzen Head and the Fastnet. How they ever managed to get through the submarine zone, at a time when the U-boats were operating a long way out in the Atlantic, was a mere matter of luck, especially in the summer months when the winds were moderate and the sea calm. Many of these sailing ships were uninsured and ran big risks, with such cargoes as timber, then very valuable.

Those who got through by chance made fortunes ; but the rest, with grain and other commodities, were torpedoed or shelled by submarines or raiders. And by the time the war was over the poor old sailing ship had almost disappeared from the ocean.

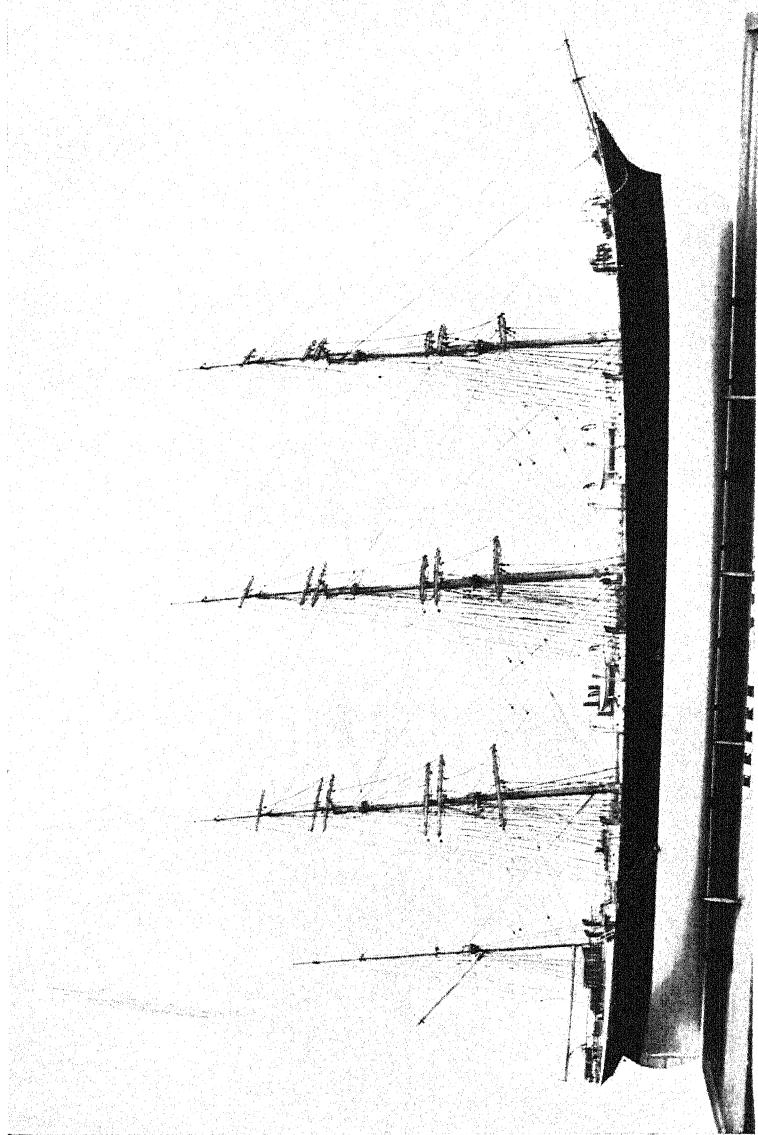
But in the 'eighteen-nineties, that period which some people have recently "discovered" as so full of interest socially and artistically, there arose quite a new impetus to the sailing ship. This was the time when the steamer had definitely proved herself queen of the seas in regard to speed and reliability : there was no denying that. The clippers had been fast, yet the steamship was faster still. But there arose a demand for a type of sailing ship which would carry cargo economically, if more slowly, than in the hard-driven wooden clippers. As wood in the building of steamships gave way to iron, and iron to steel, so in 1892 we have in such a sailing vessel as the *Australasia* a ship embodying all the improved knowledge of rigging and sail-cutting which clipper seamen had bequeathed, but in addition we have better cargo-carrying facilities and a hull of riveted steel.

The *Australasia* was a four-masted barque built by Messrs. Russell of Port Glasgow. In the 'eighties they had built various other four-masters, which were to make surprisingly good passages. These vessels carried neither kites nor stun'sls, because the aim was not speed but safety. Unlike the comparatively small tea-clippers, these Russell barques were of about 2,000 tons register, and the four-masted rig (which was really a temporary reversion to the seventeenth

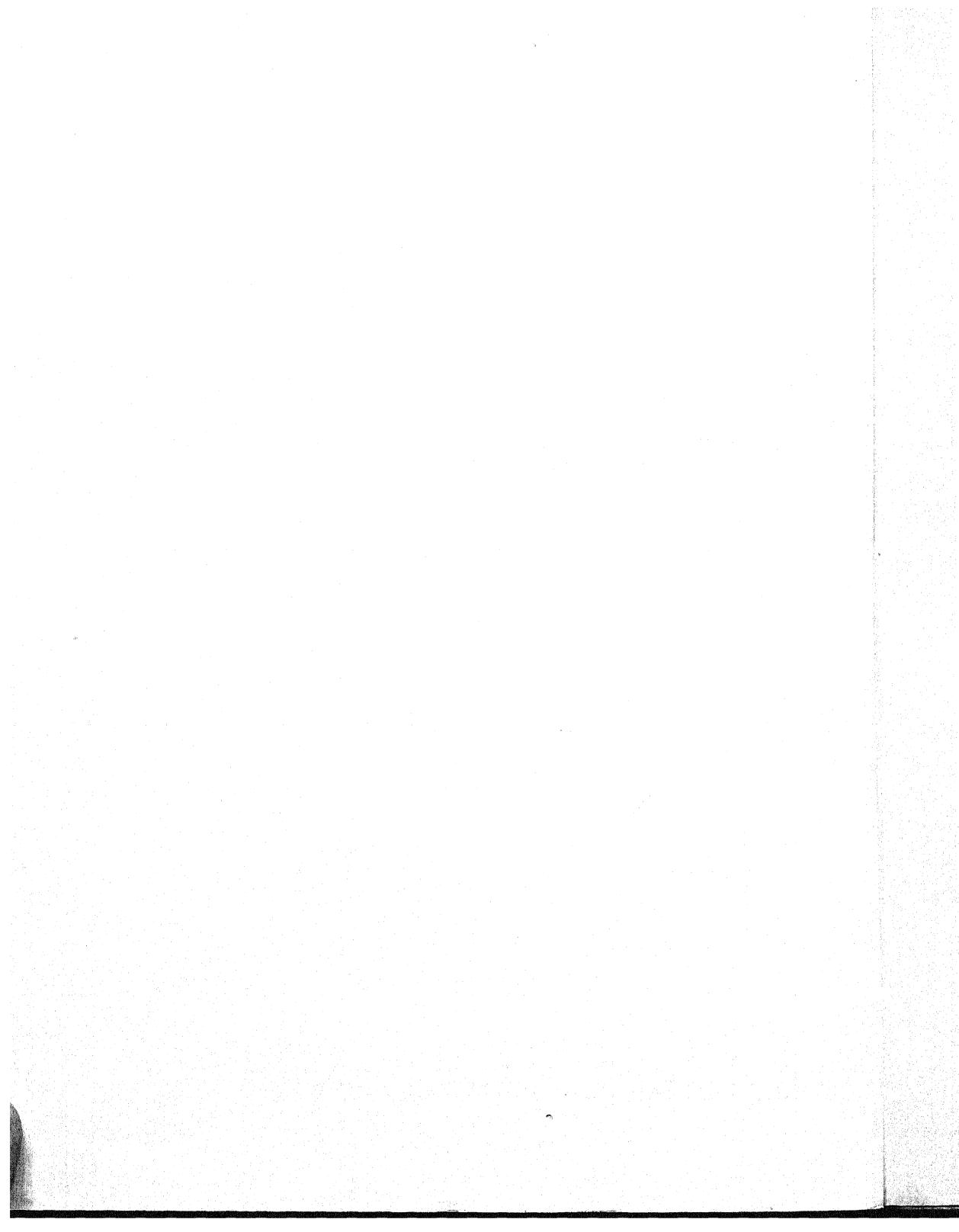
century, as we have seen) was essential, because of the increased size, allowing a more even spread of canvas, and therefore ease in handling. For, make no mistake about it, these big four-posters were at least as capable of speed as the clippers ; but they did not beat records, they were never intended to do so, they never tried. For the old-time sailor-man was gone—either ashore or into steam. Moreover, these modern barques were heavily loaded, and not trimmed for racing and record-breaking.

Still, for all that, some of these sailing vessels in the 'eighties and 'nineties made extremely good passages, in spite of themselves, on certain occasions. Thus, the *Eusemère*, which was afterwards sold to Germany and became the *Pindos*, held the record for the passage from the South American nitrate ports to the English Channel in 57 days. A sister-ship, the *Conishead*, won the record from Barrow to the Equator in 14 days 8 hours. It is interesting to note that such a fine tea-clipper as the *Norman Court* in the winter of 1870-71 took 17 days from the Lizard to the Equator.

Or consider that Russell-built *Largiemore* launched in 1892, whose registered tonnage was 1,876, whose masts and yards were all of steel like her hull. Here was a fine vessel able to carry 3,300 tons of cargo : she had 6 t'gallant yards, her fore and main yards measuring 98 ft., her mainsail 84 ft. on the head, 102 ft. along the foot, and each leach 49 ft. This *Largiemore* sailed from Rio to Adelaide in 43 days, 3 of which were spent hove-to off Cape Leeuwin in a cyclone. This vessel's best day's run whilst running her easting-down was 360 knots. The best day's run the famous



FOUR-MASTED BARQUE C.I.L.P.R.V.A.
The last and largest of the White Star Sailing Clippers. Built of steel at Belfast in 1890, gross register 3,099 tons; length, 320·3 feet; beam, 45·2 feet.
(Model in Science Museum, South Kensington.)



Cutty Sark ever made was 363 knots. Thus, when it comes down to hard facts, we realise that the glory of the clipper period is not the unattainable epoch we sometimes imagine. Some day, perhaps, it may be necessary to go back to sail if certain economic conditions are to prevail. The finest type of sailing ship could still be built, and able to do her 15 knots speed (as we shall see in this chapter) ; the difficulty would be in finding the crews skilled in the old seamanship. But that would not be insurmountable, and within a very few years, having at our disposal men of far better education and of at least as good intelligence, owners could have well-built, well-rigged ships worked by well-skilled seamen of a modern school.

In February of 1916, right in the middle of the war, that famous old sailing ship the *Loch Torridon* was dismasted in the North Atlantic during the month of February, and her crew taken off by the P.S.N.C.'s liner *Orduna*, after two steamers had passed, signalling, "Too rough to render assistance." The *Loch Torridon*, once so distinguished, had been sold to the Russians, but in her prime she was a memorable passage maker : and it was this vessel, which in the 'nineties adopted perforated sails, a proceeding which will not fail to interest yachtsmen of to-day interested in the theory of air-cushions in the belly of a sail.

Another famous vessel which ended her days during the war was the well-known *Port Jackson*, one of the first iron ships to be built. I saw her in 1915 taking in a cargo at Grimsby, and subsequently she had the good luck to get across the Atlantic in spite of our enemies ; but at last she

was caught, and sent to the bottom. The old Australian clipper *Decapolis* was another sailing ship to end her life owing to the war.

In that prosperous year 1890 the United Kingdom owned 3,000,000 tons of sailing ships. Ten years later this figure had dropped to about 2,000,000, and by 1913 to as low as 850,000 tons. This shows how certainly the old-time vessel was losing her popularity commercially, for during the quarter of a century that preceded the Great War there had actually been a tremendous expansion of the world's sea-borne commerce, and the world's tonnage had trebled in volume. But it was in favour of steam, and not of sail.

It was the opening of the Suez Canal which gave the hardest knock to the sailing ship, for owners were hoping that their cheap rates would enable the wind-jammer to compete with the steamer; yet in practice the steamer was found more lucrative. But the sailing ship still went on, determined to hold her head up till the last. Some of the vessels built in the seventies for the New Zealand emigrant trade used to make quite fine voyages. The *Nelson*, for instance, built by Robert Duncan on the Clyde in 1874, sailed from Otago Heads to Cape Horn in nineteen days. She is still afloat, rigged as a barque and working out of Valparaiso. Her dimensions are 1,323 tons gross, 239 ft. 3 in. long, 36 ft. beam, and 20 ft. 7 in. depth. Some others previously sailing in the New Zealand trade are now in the service of San Francisco owners.

Of the Russell-built sailing vessels, many are happily still afloat if no longer flying the British flag. The four-masted

barque *London Hill*, now a Swede and named the *Gullmarn*, after many a voyage from San Francisco to Liverpool via the Horn, still carries on. During the Great War she sailed out of Gothenburg bound for Capetown, and in order to avoid the danger zone went right away north of Scotland and fell in with such heavy weather that her deck cargo of timber was swept over the side. But after a voyage of eighty-two days she managed to get safely to Capetown.

One of the recently condemned sailing ships was the Norwegian-owned *Sorfarereh*, which was the largest sailing craft in the Norwegian Mercantile Marine. British-owned and British built she had been when named the *Scottish Lochs*. Constructed of iron, she was originally full-rigged of 2,649 gross tons. But that fine four-masted barque *Archibald Russell*, launched at Greenock in 1905 by Scott's Shipbuilding and Engineering Company, is to us of the utmost interest, since she is the last big sailing vessel for ordinary trading to be built for British owners. Think of her, then, as the last of that wonderful race which has included Mediæval, Elizabethan, East Indiamen, Blackwallers, clippers and a host of other historic ships through the ages. She is not the very last sailing ship to be built, but the last British owned. The *Archibald Russell* is fitted with bilge keels, and these have been found to be a great source of economy. For, as everyone knows, in all ocean work the loss by chafe of sails, ropes and gear is something serious: these bilge keels have prevented much of the rolling. Nor have they apparently interfered with her speed, for she has made some quite fair records such as Capetown to Melbourne

in 40 days, New York to Melbourne in 92 days, Cardiff to Rio in 45 days ; and she can carry about 3,900 tons of cargo.

The great drawback to the employment of sailing ships is the uncertainty of their voyages. The other day I was talking to a merchant who bewailed the fact that it was impossible, because of this reason, to charter these good-looking craft. Sentimentally he would send his cargoes by them every time, but commercially what was the good, seeing that the sailing ship might be weeks overdue ? And then there is the serious question of insurance, which is even still more important than in the case of the steamer. But perhaps, even more acute is the difficulty in getting competent officers and crews for these sailors. To a limited extent sail will always be used, and we shall never be able to say that it is literally dead. For example, the timber trade between the Baltic and Australia, or the coal trade from New South Wales across to Chile, and back with nitrate, is likely to continue.

Before the war the Germans, with their five-masters, used to sail most regularly between Hamburg and Peru, and the *Potosi* made eleven consecutive voyages at an average rate of eleven knots. The *Preussen*, five-master, was at one time the largest vessel afloat. Built of steel in 1902 at Geestemünde, she was of 5,081 British registered tons. On Saturday night, November 5, 1910, she collided with the Newhaven-Dieppe s.s. *Brighton*, and damaged her jib-boom. She then ran back up Channel, signalled to Beachy Head, anchored for a while off Dungeness, but lost cable and anchor, and in heavy weather went still farther up

Channel. A Dover tug tried to hold her, but with all that top-hamper and in that heavy gale it was impossible to get her to windward, and finally she drifted into Crab Bay, just to the east of Dover, about 5 o'clock on the Sunday night, and grounded at four hours after high water. Here she remained until she became a total wreck.

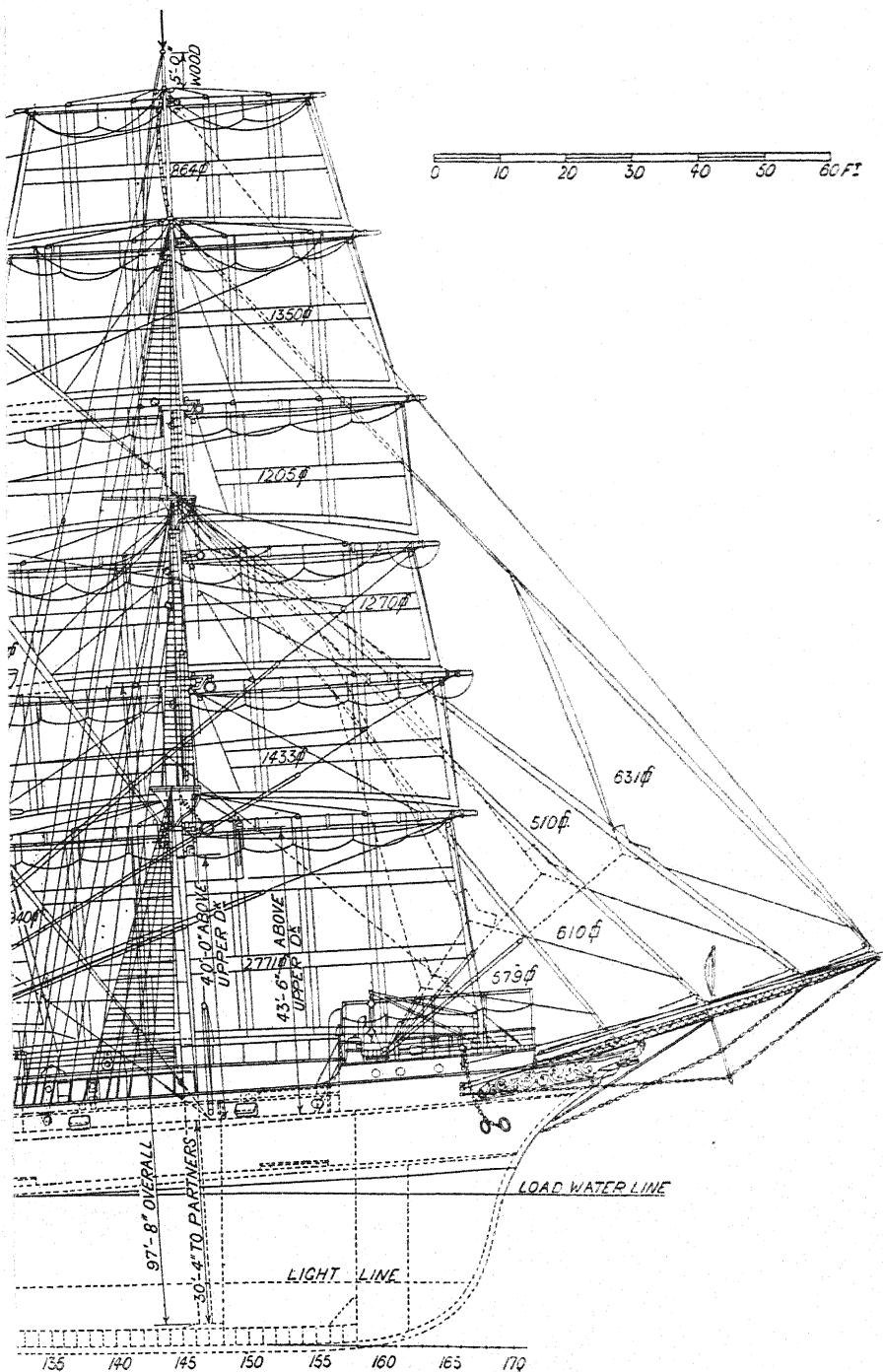
Now, since the war, the Germans have renewed their practical interest in the sailing ship running to South America, but the rig is a little different, and should be noted. These post-war craft, though five-masted, are auxiliary schooners with a special arrangement of square topsails on some of their masts. Thus we have a rig that needs few hands to work, and is most suitable for ocean voyaging, the use of those square topsails being invaluable when in the trough of the sea and lower canvas is partially blanketed. Sheltering from the mid-winter weather there was a unique spectacle in Plymouth Sound one week early in 1925, which was reminiscent of the olden days. For here were two of those five-masted German schooners and a Finnish barque, all within a short distance of each other.

These German five-masters are square-rigged only on the first and third masts, setting double topsails and a t'gallant on each. They are also fitted with wireless. But one of these ships, the *Adolph Vinnen*, whilst on her maiden voyage, was unable to wear off the lee shore near the Lizard, and on February 11, 1923, became a wreck, her crew of twenty-four being all rescued by the rocket apparatus. The loss of that fine French ship *La France*, since the war, was another blow to a dwindling fleet, and the pathos of it was

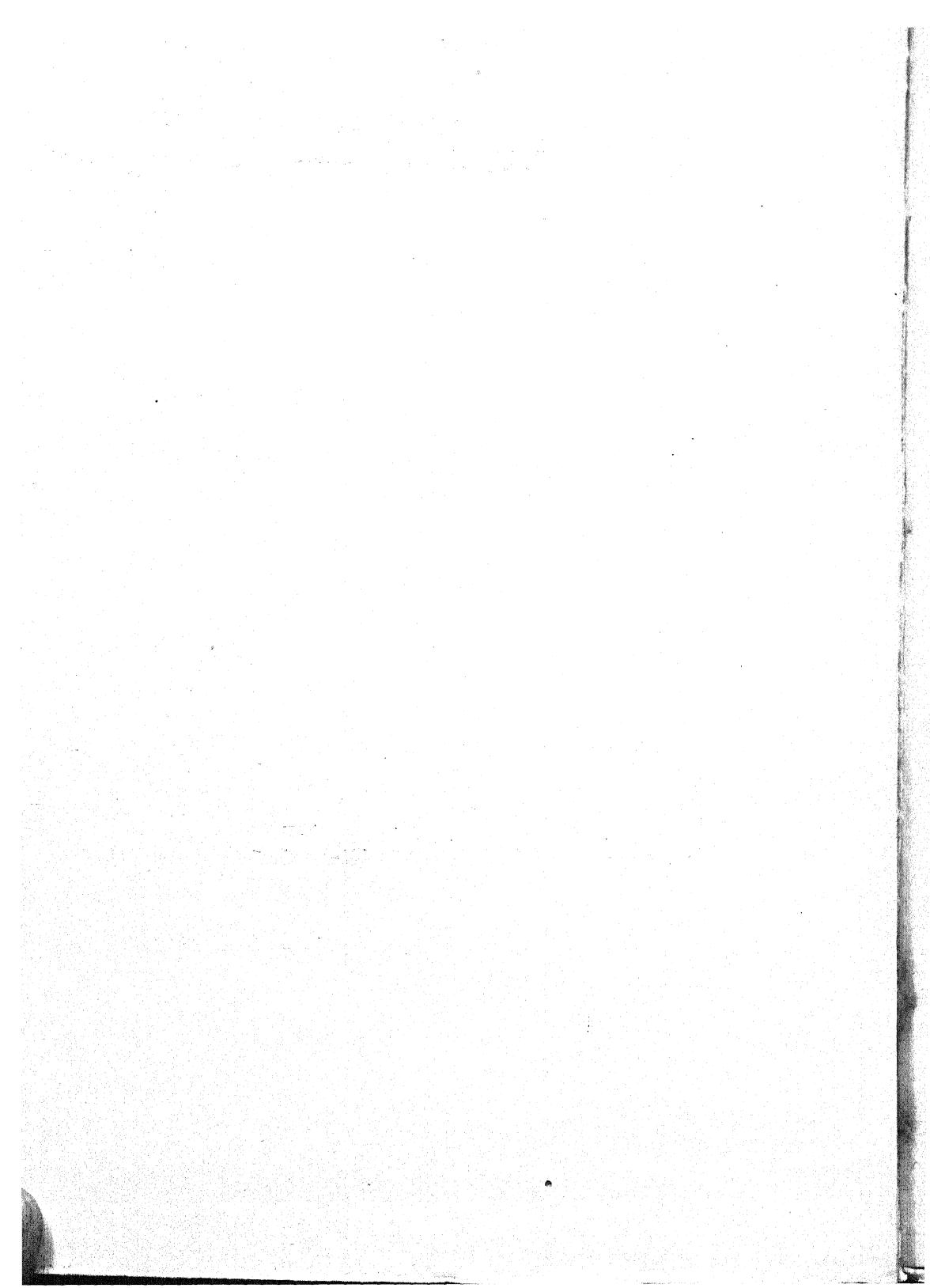
that she was just off her New Caledonian port of destination at the time. One of the finest modern sailing ships was the French-owned barque *Loire* of 5,760 tons displacement. Four-masted, she was actually bigger than the *Great Republic* of which we spoke in a previous chapter. The Germans owned a fine three-masted ship-rigged training vessel in the 2,150 ton *Princess Eitel Friedrich*, which is more like a most beautiful yacht.

But, of course, the most wonderful sailing ship afloat to-day, and the largest ever built in the British Isles, is the Danish-owned *Kybenhavn*. This last year, when she was in the port of London, I went aboard her, and as one stood on the poop and looked forward, it seemed as if the ship were an Atlantic liner, rather than a sailer. This five-master is the very latest, and most probably the really final, expression of the art of building sailing ships on a big scale. You look up at her masts in wonderment. Two hundred feet from truck to keel, or 160 from the maindeck, and all the same height. "What can you do?", I asked the Second Officer. "Seventeen knots?" "No," he answered, "we have done sixteen in a squall, but fifteen is about our speed." Well, it is interesting to note that a big sailing vessel built of steel can still keep up that fine rate.

When her forty-four sails are set she has about 50,000 square feet of canvas up, and this is enough to send any steamship officer into a fit. There are twenty-three miles of standing rigging and running gear, 1,200 blocks, and so on. In this fine vessel we have summed up all that has ever been known of sailing craft and all the most up-



age, 3,365 tons; load draught, 24 feet; sail area, 52,000 square
feet; length of standing and running rigging, 27½ miles. (See p. 160.)



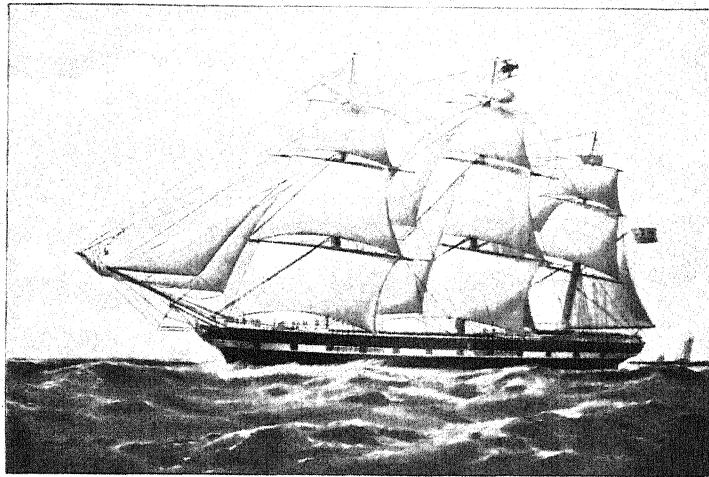
to-date knowledge in naval architecture and building. The entire standing rigging is of the best steel, and all the running rigging chiefly of manilla, all the masts and yards like the hull of steel. This ship revived an old clipper practice by sewing the owners' initials and houseflag on the fore lower topsail. Her sail plan consists of double topsails, double t'gallants and royals, and she carries a wireless aerial. Her deck is 390 ft. long, but from the end of the bowsprit her length over all is 430 ft. Her moulded breadth is 49 ft. and her deadweight carrying capacity 5,200 tons, her load displacement 7,900 tons.

It would surprise some of the ancient seamen to find here a double-bottom and an auxiliary engine driving a two-bladed propeller. But she is something more than a mere freighter: she is a training ship also for the budding officers of the East Asiatic Company of Copenhagen. Built by Messrs. Ramage and Ferguson, Ltd., at Leith in 1921, she needs a couple of hands to steer her even in fine weather; and four in bad weather. Steering is by hand-gear amidships on a bridge where two big wheels are mounted. There is also wheel steering aft.

At each hatch there are a derrick and a motor winch, and she is lit by electricity—two more items that would surprise the old East Indiamen crews. Her total complement is sixty-five, including two engineers and wireless operator. I am not sure that the *København* is going to be a financial success. But that is not the question. As a training ship we can only regret that there are not half a dozen like her under the British flag to build up a new

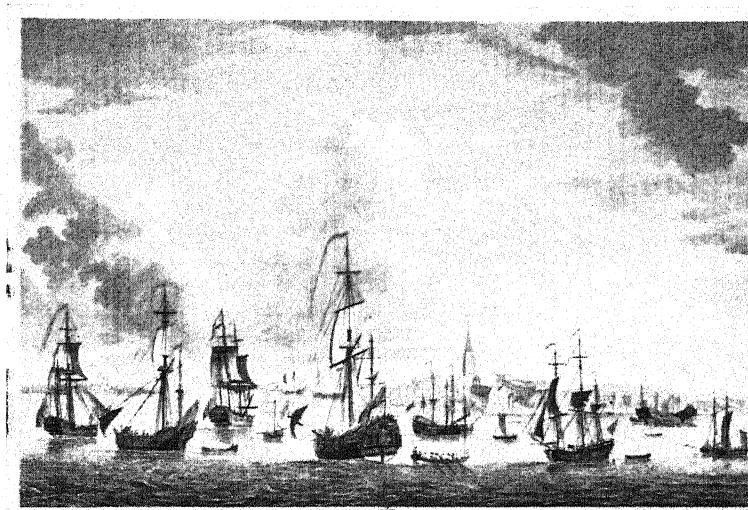
seamanhood according to the old traditions. But as a school for the Danish owners' future officers, could anything be better?

Thus, at last we have come to the final and full development of the full-rigged ship and barque. We have seen it evolve from the Egyptian Nile ship to the first quarter of the twentieth century through *Santa Marias* and *Ark Royals* and *Cutty Sarks*. But our story of the ship-rigs is not yet finished, and we shall now go back to see how those smaller craft that we all love came about.



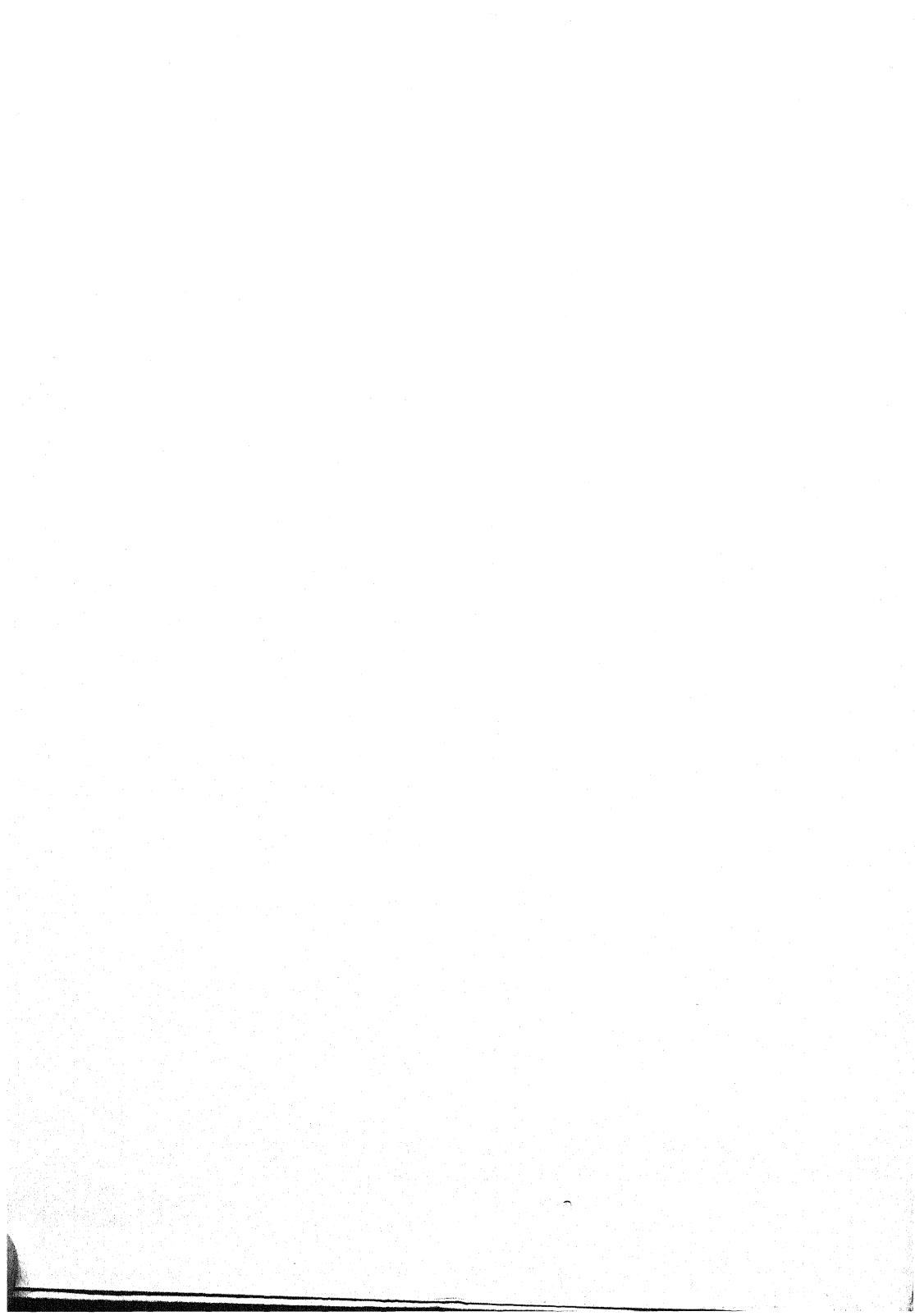
CLIPPER SHIP *TRUE BRITON*.

Of the year 1861, showing the transition stage between the old East Indiamen of the early nineteenth century and the four-masted barques of the eighteen-nineties.



EIGHTEENTH-CENTURY FORE-AND-AFTERS.

Reading from left to right, the first two are the yachts *Catherine* and *Fubbs*, and (to right of full-rigged, ship) yacht *Charlotte*, with Lord Anson aboard. The big yacht in the centre is the *Mary*.
The scene is Harwich harbour.



CHAPTER XIII

EARLY FORE-AND-AFTERS

WE have seen that, according to evidence which goes back thousands of years, the square-sail was the oldest ship-rig in the world's history ; that it was used in those old dynastic craft of the Nile, that it was subsequently modified and multiplied for the ocean-going ships of all nations, and has lasted down to our own time.

But the square-sail has its own limitations : it will not enable a vessel to go so close to the wind as is practicable, and in narrow waters it is too unhandy. Therefore in countries where rivers and canals and narrow channels predominate something was required which would enable a comparatively small craft to be used with ease. Now the Netherlands is a region full of islands and rivers and narrow channels : it is impossible to go anywhere in that country without being close to a waterway. But in the fifteenth century came the invention of locks, and, after this engineering discovery, the building of canals flourished in many countries, so that in the Netherlands it is possible, as everyone knows, to travel from south to north without ever putting to sea.

It is in Holland, then, that the fore-and-aft rig has been developed, encouraged, and continued in a unique way. And it may be said at once that Britain and America

received their knowledge from the Low Countries primarily. At the same time we must remember there did reach the Mediterranean that lateen sail at some unknown date, but introduced possibly by the Arabs after they had come farther north. I think there can be very little doubt, though it cannot be proved definitely, that this lateen sail was evolved by tilting the old Nile square-sail ; the modern Nile nugger and the Oriental proas help to support this theory. But, apart from saying that the lateen was at least by mediæval times a well-used rig of the Mediterranean, and its sail was embodied in the full-rigged ship as the mizzen, we cannot put an exact date to it.

In Northern Europe the lateen never held sway, but a different kind of fore-and-aft rig was adopted. Let us put aside all pretty theories now and confine ourselves to hard historical facts which can be supported by evidence ; for otherwise we shall only form wrong conclusions. We turn to Holland of the fifteenth century, an epoch that was the most momentous of her existence, for in 1425 the herring had forsaken the Baltic, begun to move down the North Sea, and to present the Hollanders with sudden wealth out of which later on they were to build those fine East Indiamen. What with the increased wealth, the increased population, and opening of the inland canals, there was a great demand for transport which could be satisfied only by the fore-and-aft rig. Anyone who has spent some time cruising in Holland is aware that certain localities, except for handy craft, are shut off from the rest of the world, isolated.

After years of research and several visits to Holland; after examining pictorial and manuscript evidence, and the earliest printed books and those primitive maps which do sometimes give sketches of old ships, I cannot find any reason for the existence of this North European rig before the year 1416. The earliest English pictorial evidence that I can find is of 1527, and the next is sixty years later. This rig is substantially the same, namely, a sprit lugsail.

The charming and delicate picture in *Les Très Belles Heures de Nôtre Dame*, which was regarded by experts as the work of Hubert van Eyck, who lived from about the year 1370 and died in 1426, is the earliest known illustration which shows a North European craft with the fore-and-aft rig. Unfortunately the original picture was destroyed about twenty-six years ago, but it has been reproduced in the *Mariner's Mirror* (vol. vi), and we can see what was obviously one of the boats of that day which used to sail along the Dutch rivers, and the Maas in particular.

The subject of the picture is the voyage of St. Martha and St. John; but Van Eyck, who was himself born at Maaseyk on the Maas, has, of course, shown the two saints in the very kind of craft with which he was familiar, of his own time and place. Thus we are shown an open boat with sprit lugsail so remarkably modern that it might have been used by a twentieth-century Devonshire crabber. This painting is thought to belong to about the year 1416, and if that be true, then it is fair to assume that the sprit

lugsail dates back at least to the beginning of the fifteenth century, and it is probably considerably earlier still. In the absence of direct evidence it would not be safe to say more than this, however. The essential fact is, that the Low Countries did by this date definitely use the fore-and-aft rig of their own fashioning, and it was soon to spread to England. How were these little fore-and-aft craft then rigged? The answer is most interesting, for at once we see the great ancestor of our old friend the Thames sailing barge. At first we have just one sail with a sprit placed diagonally. From the peak there leads a vang which the steersman holds in his hand together with the sheet. There is no headsail, but the mast is stepped very far forward. Thus, here is a handy sail that can be stowed in a minute. In a squall the sprit could be withdrawn readily, and in the old prints down to the time of early nineteenth century this rig was seen to be very popular as, for example, in the Portsmouth wherry and some of the Devonshire crabbers until the motor began to change affairs.

Now the Dutchman presently found that a small, triangular headsail would improve the rig, and so we find in the sixteenth century such a rig as the following. There is one mast, the headsail is hoisted on the forestay, and abaft the mast is the mainsail, which has no hoops but is laced to the mast. A tackle comes down from the top of the mast to support the sprit, and there are two vangs from the peak leading aft to the steersman. The sail here is quadrilateral and a bonnet is laced along the foot. We

have thus got the "shallop" or "sloep" rig, out of which were to grow the cutters, the ketches, and so on.

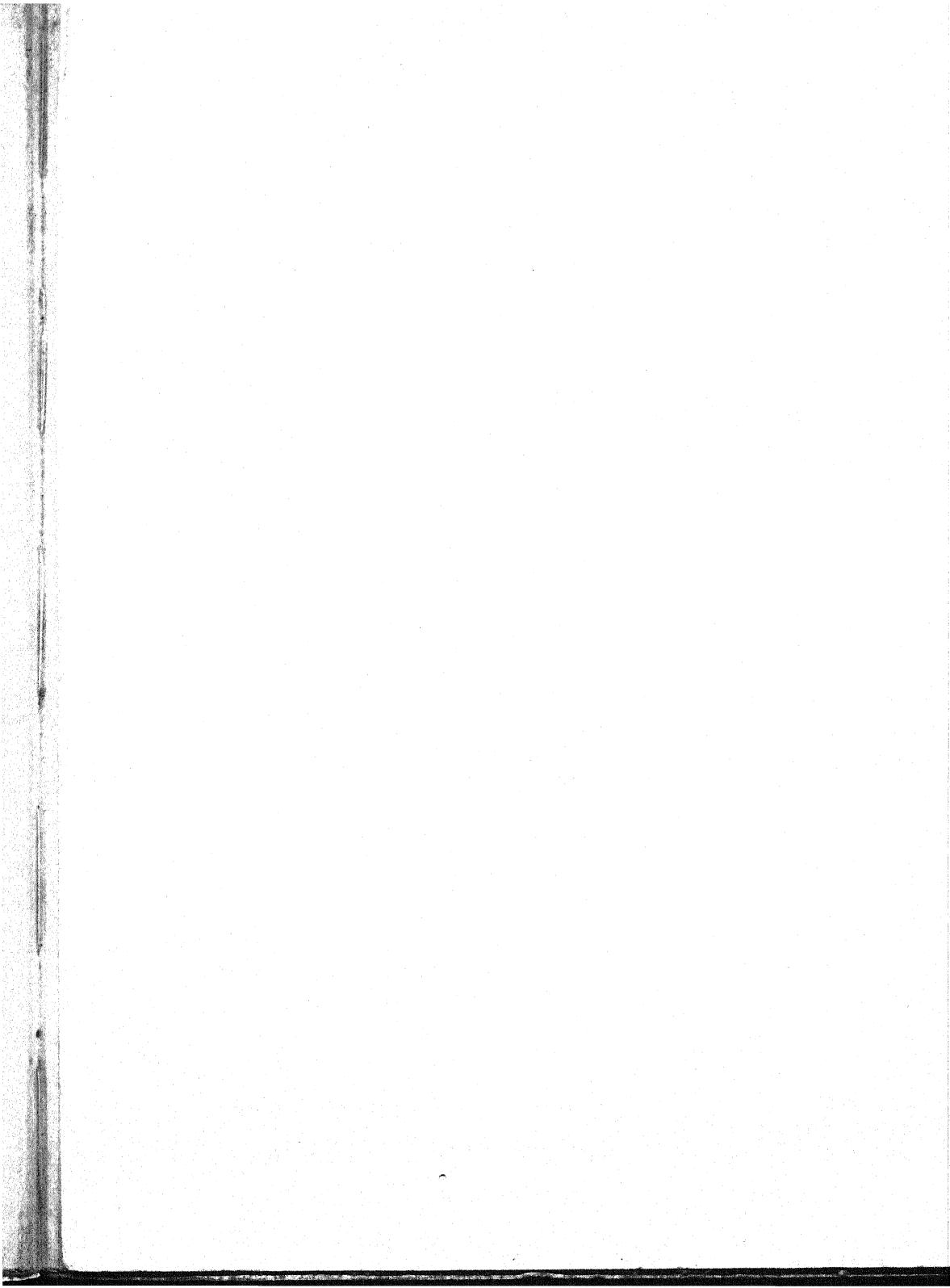
Here, then, is the nucleus, the idea in its simplest form : and craft thus rigged are able to transport produce to market or take the citizens from Amsterdam down to Rotterdam. The next improvements consist in building bigger vessels, adding such things as runners and leeboards. We shall come back to this presently. But there was also being developed in Holland a kind of schooner of which two instances may be given. In the former we have mast and yard all in one : or rather, the yard acts as mast. This must have been a very fast rig for a thirty-foot open boat in fine weather, very handy for the sheltered waters of Dordrecht and neighbourhood, but not for the Scheldt when beating over a weather-going tide. This rig is a kind of Dutch lateen, and the stern of the boat is shown beautifully carved like a miniature big ship.

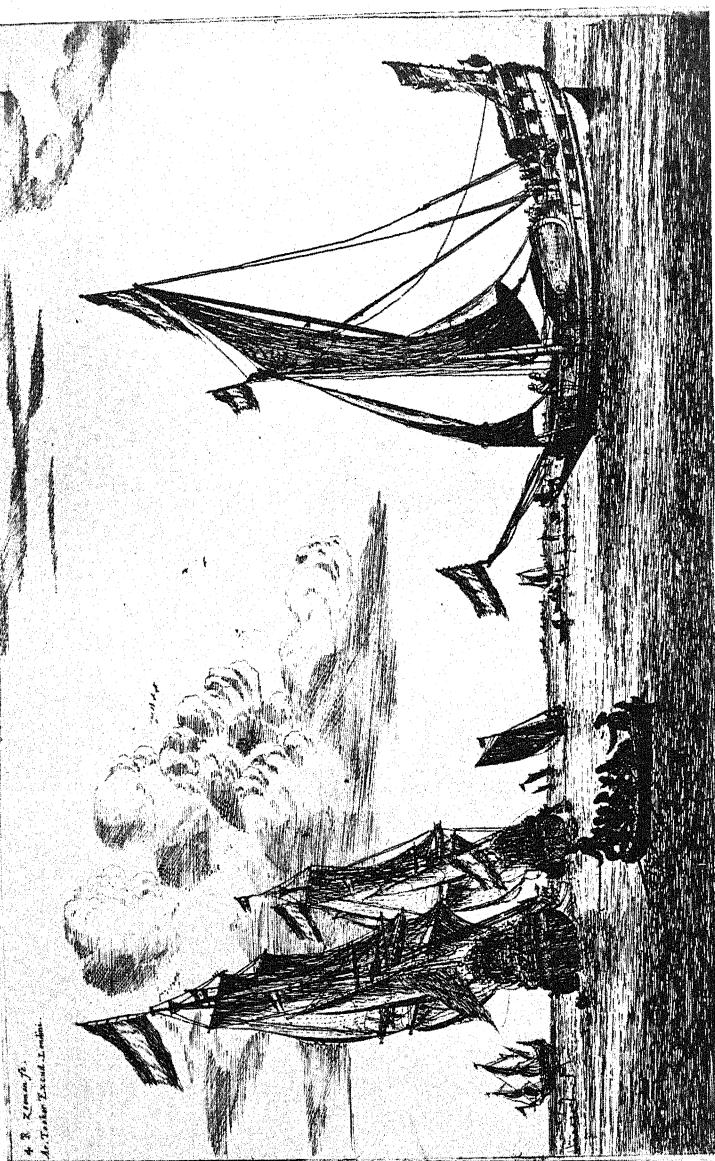
The second kind of small schooner also had a raised stern, but the rig was as follows. The foremast is stepped just as far forward as ever it could go. There are no headsails, but abaft the foremast is laced a strangely cut canvas with no boom and a very tiny gaff, so that in effect it is a kind of jib. The mainsail has a similar small yard but also a boom, and in both cases there are not two halyards but one. The so-called modern Bermudian rig is therefore very similar to this craft's mainsail. These halyards were attached to the yards not by shackles but by curved, sickle-shaped hooks, so that the sails could be taken off at once when entering lock or coming alongside ship or quay.

The latter part of the seventeenth century found the Dutch fore-and-afters well developed within a certain sphere. Why not? Holland was at her prime, she had made fortunes not merely from her fisheries, not merely from her East Indies, but as the great sea-carrier of the world. She built herself wonderful seventeenth-century houses and picturesque warehouses. She had commissioned such artists as van Goyen, van der Velde, Storck, Pompe, Verschuer, and others to paint her famous sloepes, yachts, galleots, boiers, and other craft. And as you go through the Low Countries to-day, and look around at those signs of former prosperity, it is as if Holland had decided to end her progress somewhere about the year 1699 and gone to sleep ever since.

We come now to the word "yacht," which originates as follows and with special meaning. The old Dutch word "jager" means a hunter, from "jagen," to hunt, to chase. Thus a "jacht-schip" was a special kind of craft which would chase or sail quickly, and during the Anglo-Dutch wars we find the jacht-schip or yacht used as a despatch vessel. Van der Velde, who was present and sketched the battle of Lowestoft on June 3, 1665, was aboard one of the Dutch Admiralty yachts, and I have before me a reproduction of a rough sketch made by him the day before the fight, with the yacht in the foreground and the line-of-battle ships in the background. What was this yacht like? How was she rigged?

Well, fortunately not only have the great Dutch marine masters of that century left us paintings and sketches, but





SEVENTEENTH-CENTURY SLOOP.
The vessel on the right with sprit mainsail and foresail and leeboards shows a naval yacht. The wreck is reminiscent of the full-rigged ships of that time.

From the Pepysian Library, Magdalene College, Cambridge. Photograph in Science Museum, South Kensington.

we have a contemporary model which shows everything we wish to know. The hull shows the influence of the Dutch warship and East Indiaman of the time with its gilt work and carvings, its deck-house, aft, and projecting glass windows at either quarter; its decorative gun-ports, its general air of solidity and prosperity reflected from its owners. The apple-bow, the lee-boards, and many other details closely resemble some of the older sailing craft still working the Scheldt to-day. But the rig of some seventeenth-century Dutch yachts had so far advanced that the sprit going diagonally across the mainsail had been discarded. The normal working-rig was mainsail and staysail. The former had no boom, but a yard with vangs and pendants coming down from the peak to port and starboard, the yard being peaked fairly high. Runners were on each side, and the rigging was of hemp with dead-eyes. But in suitable weather a bowsprit was run out from the stem-head and a big jib was set forward of the fore staysail. But, for running, a square topsail was hoisted so high that its yard was not much below the truck. Some distance below the foot of this sail is that old "vergue sec," or barren yard taken, in idea at least, from the mizzen of the seventeenth-century full-rigged ship. Its use in the yacht was for the lead of the square topsail sheets. It is to be noted that the yacht's mainsail had a bonnet laced along its foot, and to unlace it would be the equivalent of reefing. The yard is standing, and sail is stowed by brailing it to the mast.

Windlasses were fitted close to the mast in some of these craft, and besides the despatch yachts ("advys-jaghts"),

there were those owned by the Dutch East India Company and by certain distinguished personages whose business took them from one inland town to another. Not forgetting the prosperity of this period and great naval activities, it is hardly surprising that the Dutch loved to use their yachts for mock sea battles and sham fights when these craft engaged not in racing so many times round a course, as is our modern custom, but formed themselves into line-ahead, eased off their guns, and generally made a most imposing and impressive sight. The Admiral or Commodore would hoist signals as if he were a real naval officer, and the yachts had to obey. So keen was the enthusiasm and so realistic their tactics that they even practised boarding each other in accordance with the custom of their fighting forefathers of the sea.

It was Charles II who introduced the yacht from Holland into England under the following circumstances. He had been living on the Continent since he was twenty-one, and when on May 8, 1660, he was proclaimed King of England he was still in the Low Countries at Breda. Now for his voyage to England, the Prince of Orange placed at Charles's convenience the finest yacht which belonged to the Dutch Admiralty at Rotterdam. This craft was similar to the one just described, for we have by a contemporary artist a picture of her. From Breda to Rotterdam Charles sailed in this beautifully carved craft, with its cabin aft and lantern by the ensign staff.

With all Charles's faults he certainly did introduce the yacht into England, for this trip especially from Breda

to Delft had impressed him immensely ; in fact he remarked that he was thinking of ordering one as soon as he got to England. Thereupon the Burgermaster of Amsterdam, a Mr. Van Vlooswyck, took the opportunity to present to Charles a yacht similar to that in which the royal progress had just been made. Thus the first English yacht was the *Mary*, which the Hollanders purchased from the Dutch East India Company, and then, after she had been decorated, painted, gilded, and carved, she was sent across the North Sea certainly by the autumn of that same year, so that Charles had not long to wait.

And she created a sensation. Before that date 1660, remarked Sir Anthony Deane to the genial Mr. Pepys, "we had not heard of such a name in England" as the yacht. And the diarist himself, on November 8 of that year, went aboard the *Mary* at Deptford. "In the afternoon Commissioner Pett and I went aboard the yacht, which indeed is one of the finest things that I ever saw for neatness and room in so small a vessel. Mr. Pett is to make one to outdo this for the honour of his country, which I fear he will scarce better."

But actually this first English-built yacht was to be a great success, for on the following twenty-first of May Pepys writes that he hears "Commissioner Pett's do prove better than the Dutch one." And so by the end of Charles's reign such was the royal encouragement that twenty-six of this new type of vessel were added to the English Navy. Evelyn, in his diary under October 1, 1661, has left for us this illuminating passage, which deserves our attention :

"I sailed this morning with his Majesty in one of his yachts (or pleasure-boats), vessels not known among us till the Dutch East India Company presented that curious piece to the King, being very excellent sailing-vessels. It was on a wager between his other new pleasure-boat, built frigate-like, and one of the Duke of York's—the wager £100; the race from Greenwich to Gravesend and back. The King lost it going, the wind being contrary, but saved stakes in returning. There were divers noble persons and lords on board, his Majesty sometimes steering himself."

The following are the names of some of these Caroline yachts: *Mary*, *Navy*, *Monmouth*, *Charlotte*, *Mary II*, *Cleaveland*, *Fubbs*, *Kitchen*, *Henrietta*, *Isabella*, *Katherine*, *Portsmouth*, *Greyhound*, *Jamaie*. The last-mentioned was designed by Charles himself and built at Lambeth. The yacht *Anne* of 1663 was estimated by Christopher Pett to cost £1,850, without guns. This was for the Duke of York. The *Kitchen* was a hoy used as a tender. Evelyn refers to the fact that when Charles raced in his yacht from Gravesend to Greenwich and back, "His barge and kitchen-boat attended. I brake fast this morning with the King at return in his smaller vessel, he being pleased to take me and only four more, who were noblemen, with him; but dined in his yacht, where we all eat together with his Majesty."

The first *Mary's* dimensions were 52 ft. in length, beam 19 ft. She drew 10 ft., and was of 100 tons burthen. She had leeboards, carried eight guns, and a crew of twenty.

The Dutch also presented Charles with the 35-ton yacht *Bezan*, in which, by the way, Pepys used to spend some of his week-ends cruising in the Thames and Medway. Fortunately a model of the yacht *Navy* still exists: at least it is one of these twenty-six, and there are many reasons for assuming her to be this particular one. She was rigged with standing gaff, square topsail, vangs, barren yard and bowsprit as already mentioned; but no leeboards were used.

The *Navy* was a 74-tonner built by Sir Anthony Deane at Portsmouth in 1671, measuring 48 ft. long, 17 ft. 6 in. in beam, and drew just over seven feet. She was pierced for guns on either side, had a lion figurehead, and was exquisitely ornate with gilded wreaths at the gun-ports, and cupids and the royal arms at the stern. She had both quarter- and poop-deck. The *Katherine* had been named after Katherine of Portugal, Charles's wife. The *Fubbs* was a royal nickname for the beamy Duchess of Portsmouth, of whom Charles was notoriously enamoured. The *Fubbs* yacht was also beamy, being 63 ft. long, 21 ft. wide, with a draught of nearly eight feet. Built by Phineas Pett at Greenwich, in 1682, she worked out at about 148 tons burthen.

It is well known that the two Van der Veldes, both father and son, came over to England in order to paint marine pictures, and Charles II had them working at Greenwich, the artists arriving here somewhere about the year 1675. The work of these two men is so similar that it is almost impossible to say which of them created a certain

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picture. There are many Van der Velde paintings about, but a few years ago I had the good fortune to come upon some delightful Van der Velde sketches done in pencil and Indian ink which actually depict for all time such yachts as the *Mary II*, *Katherine*, *Charlotte*, *Portsmouth*, *Navy*, *Anne*, and *Greyhound*. The first-mentioned has the Royal Standard flying at the masthead, the Jack on the jackstaff at the end of the bowsprit, and the ensign aft. The sails set are jib, forestaysail, mainsail and square topsail ; the jib being hoisted up the foretopmast stay. The bowsprit in these craft was not roughly parallel with the deck, but highly steeved at a great angle after the manner of the seventeenth-century full-rigged ships. And we may take this as the settled, standardised type of yacht of the late seventeenth century. They were in effect just a small, light type of warship rigged as fore-and-afters, capable of being used either against the King's enemies or for pleasure cruising.

The fact that Charles II spent some time as an exile in the Netherlands was the cause, then, of the yacht being introduced into England. Sailing for pleasure up and down the Thames became a new and fashionable thing to do, and before long both the Queen and the Duke of Richmond got bitten with the enthusiasm and insisted on becoming yacht-owners. So, too, the French felt the same impulse, and Charles allowed Sir Anthony Deane to proceed across the Channel in order to build two yachts for Louis XV. And, according to Pepys, Sir W. Batten was one of the members of English society who had begun

to take to the sport. In September 1663 we find this knight and his lady accompanied by the diarist going down by coach to join the yacht *Charlotte* at Greenwich. Pepys went later on shore, and under the date September 3 knowingly writes: "The wind very fresh, and I believe they will be all sick enough, besides that," he adds in reference to Lady Batten, "she is mighty troublesome on the water. . . . I left them under sayle, and I to Deptford." Then two days later Pepys adds significantly: "I hear this day that Sir W. Batten was fain to put ashore at Queenborough with my Lady, who has been so sick she swears never to go to sea again. But it happens well that Holmes is come home into the Downes, where he will meet my Lady, and it may do her more good than she looked for."

It is probable that yachting would have gone ahead more quickly than it did, had not the Plague of London and the Great Fire of London knocked the heart out of society's pleasure. At length, however, the sport was so far revived that the first yachting club in the British Isles was started in 1720, not in England but in Ireland, as the Cork Water Club, afterwards to be known as the Royal Cork Yacht Club. Through certain visits to Queenstown during the Great War I was able to examine some of the delightful rules and regulations which obtained when that club's eighteenth-century yachts paraded in semi-naval fashion outside the harbour, and then the sportive and hearty members, having duly obeyed the Commodore's signals, came back into port and sat down to a feast with good cheer

and vintage wine. No one was in a hurry during those days, until at sea the Commodore hoisted Dutch colours, which was the signal to chase, and then these ponderous, bluff-bowed craft went bumping into the Atlantic swell like little men-o'-war.

CHAPTER XIV

DEVELOPMENT OF THE FORE-AND-AFT RIG

If the Royal Cork Yacht Club, originally known as the Cork Water Club, is the oldest in what used to be called the British Isles, the Royal Thames Yacht Club is the most ancient in England, and last year celebrated its 150th anniversary. For in 1775 the Duke of Cumberland founded the Cumberland Fleet, the club itself being known as the Cumberland Society until 1821, when the name was changed to "H.M. Coronation Sailing Society." It was then altered in that same year to the Thames Yacht Club, and so continued until 1830, when a royal warrant was granted and its present title was instituted as the Royal Thames Yacht Club, of which his Majesty King George V is patron. Thus, right from the time of Charles II, yachting has owed a great deal to the interest of the reigning family. Happily the silk flags of the Cumberland Fleet are still carefully preserved.

As we examine the old pictures, we still see the great influence of the Dutch in those bluff-bowed, tubby early yachts and sailing boats: even the painting of the hulls and spars shows Netherlandish fashion. And the long pennants, again, indicate the semi-naval character of the sport in those days. For a long time yachting was a dignified recreation for men of wealth and distinction, and

the idea of building fast racing craft is of comparatively modern origin.

But the growth of British supremacy as a maritime power, the victory of Trafalgar, and the increasing interest taken in seafaring matters generally during the nineteenth century gave to yachting that impetus which had been temporarily lost after the Plague and Great Fire of London. Thus in 1815 we find the Royal Yacht Club instituted, though its title of Royal was not added till five years later, and then in 1833 it became known as the Royal Yacht Squadron. But between the years 1823 and 1844 the sport had progressed to such an extent that such clubs as the Royal Northern, Royal Western, Royal Eastern, Royal St. George's, Royal Southern, Royal Harwich, Royal Mersey, and Royal Victoria Yacht Clubs had been established. In 1872 came the Royal Corinthian and the Royal Cinque Ports Yacht Clubs, but the Royal Clyde and the Royal Channel Islands Yacht Clubs had been inaugurated in 1856 and 1863 respectively, and the Royal Irish in 1846. In America the New York Yacht Club, however, was started as far back as 1844.

Two years later yacht racing had become very popular in America, and then in 1851 the famous *America* crossed the Atlantic and won the cup presented by the Royal Yacht Club. It is true that royal patronage continued to do much for the greater interest now being shown in yacht racing. The first royal cup had been given by William IV to the Royal Yacht Squadron in 1834, and in 1843 Victoria also gave cups for racing. The privilege of these yachting

associations being allowed to prefix the word "Royal" and to fly the Blue Ensign came as a further encouragement in the British Isles. Only during the Great War was the Royal Yacht Squadron forbidden to fly the White Ensign, and certain other yacht clubs to fly the Blue Ensign; for after the armistice these privileges were restored.

But before we go any further let us see how the fore-and-aft ships themselves developed as types during the eighteenth and nineteenth centuries. And all this time we shall see that Dutch influence was still there, but gradually diminishing. It was natural enough that it should be concerned not exclusively with yachts but every kind of craft not square-rigged. In a previous chapter we have referred to the Dutch fishing vessels of the seventeenth century with their two and even three masts, each with one big square-sail. From these there naturally evolved the two- or three-masted luggers employed chiefly in fishing, but also for other purposes such as ships' boats. Indeed, such craft as the Deal lugger, the old Yarmouth "yawl," the Scotch fishing luggers, and the French *chasse-marées* trace their ancestry back to the Dutch buss-ship which used to go fishing in the North Sea waters.

In the same way eighteenth-century boat design followed Dutch guidance almost blindly, for it was not an inventive age: originality was quite dead, the new birth had not yet come. The coasters, such as used to trade between Holland and the English east coast ports, with their heavy hulls and clumsy lines, their bluff bows and beamy proportions, had settled down into a serviceable, strong, and

seaworthy type with little regard to speed. Take the case of the Dutch hoeker, which was sometimes a trader and sometimes a yacht. Here we see very clearly the duel going on between the old and the new: the square rig and the fore-and-aft. Originally the hoeker, a two-master, has a square-sail on the main and on the mizzen-masts. Then she added a highly steeved bowsprit with inner and outer jibs and fore staysail, and a fore-and-aft mizzen sail, and also a fore-and-aft mainsail. But at the same time we note that she retained the lower course, the square topsail, and the square t'gallant sail on the mainmast.

There are braces and sheets and yards, and even bow-lines, too. The fore-and-aft mainsail is a little curious, for it has both gaff and boom, but can also be brailed to the mast, and there are vangs from the peak. We are speaking now of the second half of the eighteenth century, and though the mizzen is just an ordinary loose-footed sail with yard and boom, we notice that the topping lift has come into use. Such a craft as this, very slightly modified, used to be seen in the Thames estuary in the time of E. W. Cooke, the famous marine artist, whose death did not occur till 1880. But no two English craft have ever shown their Dutch family characteristics so closely as the Yorkshire billy-boy and the Thames sailing barge.

As to the former, Cooke has left us an engraving of one of his time, but cutter-rigged. She sets both a square topsail and also a large square-sail for running. It is noticeable, too, that in the craft used for more open sea work than for inland waters the yard has already been lengthened.

In the engraving mentioned the hull is distinctly Dutch-like, with its lee-boards and apple-stern, and the mast is stepped in a tabernacle.

We know from contemporary pictures that even late in the eighteenth century the first *Mary* of Charles II largely influenced the design of our yachts' hulls. The next stage was to add a boom to the mainsail, but the bowsprit was still highly steeved, and then the lofty stern begins to come down so that the poop is no higher than the ship is forward. And when once Dutch sterns had been discarded there was room for the counter. But even as late as 1781 we see how strong was the influence of the contemporary full-rigged ship on fore-and-aft yacht design. The fact is, that in those days there was no specialising between yacht architecture and big ship designing. At first the poop deck and beak and figurehead, and even windows on each massive quarter, remain in the yacht; but presently the design becomes simpler, the poop and beak and figurehead and cabin-windows disappear, and we have a yacht of about 150 tons with a long, straight keel and rounded forefoot and moderately raking sternpost. From the latter there projects the embryonic counter, but the rudder occupied most of this small amount of overhang, so that the counter as such is hardly discernible. It is, however, an attempt to get away from the Dutch transom stern. Plenty of beam was still an important characteristic, as will be seen from actual measurements.

Let us take a 152-ton cutter of about the year 1780. From the foreside of the stem to the after part of the stern-

post she measured 60 ft. in length. But her beam was 25 ft. 4 in. Or take another yacht, this time a vessel of 141 tons intended to be "an expeditious sailer." She measured in extreme beam 21 ft. 2 in., yet her length from the fore-side of the stem to the after-part of the stern-post was only 75 ft. 5 in. But then we have to remember that the craze for yacht racing had still to come in; even those little contests in the time of Charles II were quite mild affairs. Rather we have to think of these heavy if stately craft making an imposing marine parade with their hulls and flags and baggy sails. It is true, however, that as early as 1749 yachting had been so far revived that a dozen of these craft raced from Greenwich to the Nore and back for a silver cup presented by Prince George. In the year that the Cumberland Fleet was instituted sailing matches were held for smaller craft both in the Battersea reach and from Westminster Bridge to Putney Bridge.

The eighteenth-century pleasure craft were nothing if not imposing, and the Cork yachts in painting and gilt work were more wonderful even than the King's yacht on the Thames. To have seen these vessels coming out of Queenstown Harbour would have been a wonderful sight, for we know that they were not allowed to get under way until the Admiral made the signal by his gun. He then took up his position in the van and the fleet proceeded to sea with drums beating and flags flying, as if bound for the wars. Etiquette was wonderfully strict, and it was one of the club rules that its admiral was to be saluted,

if not by guns then by three cheers. To this the Admiral returned his salute, and then the captain of each yacht was to give one more cheer. So, too, the Cumberland Fleet's Commodore had for his use a special printed code of signals and the fleet could be manœuvred just as if they were small men-of-war. The Commodore's hat (worn "athwart-ship" fashion as made famous by Napoleon) is still preserved in the Royal Thames Yacht Club house.

In those days yachting was sometimes quite exciting, when England had so many enemies at sea. Thus in July 1793 a yacht cruising round the Isle of Wight was captured by a French privateer, and the Englishmen were taken into Dunkirk, robbed of everything of value, and then released. Other yachts were sometimes fitted out as privateers with guns and letters of marque, and even as late as about 1840 the hermaphrodite brig *Kestrel* belonging to the Earl of Yarborough, Commodore of the Royal Yacht Squadron, a vessel of 202 tons, carried a tier of guns.

The precursor of the ketch was the seventeenth-century galleot which had a lateen sail on the mizzen, nothing on the mainmast save for one big mainsail, then forward of that a foresail hoisted up the forestay and a jib hoisted up the foretopmast stay, or rather, a special stay between the foretopmast stay and the forestay. The bowsprit was solid and well steeved. The next development was to turn that mizzen into a gaff sail with vangs to the peak but no boom; while, above the square-sail, were both square topsail and t'gallant sail as already seen in the hooker. Finally a boom was added to the mizzen, and

a fore-and-aft mainsail to the mainmast. And so it continues for a long time until all those three square-sails are banished, and there remain only the fore-and-aft canvas. Thus, a Flemish galleot of the first half of the eighteenth century is seen rigged with just the following sails: outer jib, inner jib, fore stay-sail, square topsail well-goared with barren yard, fore-and-aft mainsail with vangs and brails but no boom; mizzen with yard and boom and topping lift. British ketches, whether of the coasting, fishing or yachting fleets, have thus sprung from Holland originally in regard to rig, and been adapted to meet special requirements.

From the galleot there evolved that curious craft called a bomb-ketch, and Queen Anne's yacht was thus rigged. There is a tremendous fore-triangle with the mast stepped as far aft as amidships, so as to leave room for the mortars to fire. This class of vessel had been introduced into both the English and French navies towards the end of the seventeenth century. They were square-rigged, with two masts and lateen mizzen and were the immediate antecedents of the hoeker type. But the subject of these galleots and ketches is so fascinating and there is such a wealth of material both in models and contemporary illustrations in the Netherlands that we could go on indefinitely. We must return to the Dutch craft, which, like their own history, have remained practically undeveloped from the seventeenth century until to-day. Only two real modifications are noticeable in modern times: one is the use of iron for building many of the hulls, even of sailing vessels.

DEVELOPMENT OF THE FORE-AND-AFT RIG

The other is the introduction of the marine motor which nowadays is seen in every Dutch waterway.

Eighteenth-century Dutch craft used the sprit-sail to an extent that is rivalled only by the modern Thames barge. Thus with a light wind from aft a kof-tjalk would be seen under sprit mainsail, square topsail, and fore staysail—the latter laced to the stay. On a wind she would set a jib also in moderate weather. It is curious to notice that in this eighteenth century kof-tjalk there is only a single brail to the sprit mainsail, and that there are two rows of reef-points. By the nineteenth century some of the Dutch single-masted vessels, such as their inland freighters, used to set a curious topsail above the fore-and-aft sprit mainsail. The effect of this topsail was to fill in the space so as to make the sail area abaft the mast square in shape ; for the mainsail had in the course of time become so high-peaked that there was a considerable amount of empty room between mast and the sail's head. At the same time we have plenty of evidence to show that the familiar bent gaff and sprit-less boom mainsail, with no topsail but jib and staysail, were by no means uncommon in the Dutch eighteenth century fore-and-afters. Indeed, this is the really final stage of Dutch development in regard to a particular class.

In the early nineteenth century there was employed in Dutch waters a curious, flat-bottomed, kind of cutter which was a sailing gunboat, and there exist models of this class both in Amsterdam and Rotterdam. In these, as in many other Dutchmen, there is a convenient ledge

on which to rest the leeboard when not in use. Cannon are mounted on deck, but especially noticeable is a heavy chasing piece in the bows. Here was a craft that could take the ground quite comfortably anywhere: she therefore was given a very low bilge. But in order that she might have the required speed in the course of her patrol duties she was provided with the utmost amount of sail, and this is what we find. Cutter-rigged, she has both square topsail and a fore-and-aft, with a small yard set above the gaff of the mainsail. As was the Dutch custom, this square topsail was stowed to the topsail yard, but the lower course was unbent and stowed up and down the mast vertically, being hauled out along the yard as convenient.

Similarly the mainsail, whose luff was laced, was brailed to the mast; and thus both gaff and boom remained standing. In like manner was brailed the gaff topsail to the mast, by means of a couple of brails. Thus it was possible in this naval sailing craft to set or stow all sail very quickly. All that could be required were sufficient hands, and these were not lacking in a Government vessel. It is in such interesting vessels that we see the Dutch sailor's mind at its best, wrestling with problems of rig and achieving such success. And if we have long since surpassed him in that wild rush of competition, we cannot forget how much we owed him in the past for having shown us the way to rig and develop the smaller types of sail-driven ships.

During the eighteenth century a careful discrimination

was made between sloops and cutters. Thus a French authority in 1783, after explaining that the cutter emanated from England, goes on to state that in her rigging and sail plan the cutter resembles a sloop, except that the former has her mast longer, inclined farther aft, and has a greater sail area. The cutter also had but little freeboard. In order to be able to carry her increased sail she was also given a greater draught of water. The English authority, Falconer, however, described the cutter as having one mast and a straight-running bowsprit that could be run inboard on deck. He also stated that a sloop differed from a cutter by having a fixed steeving bowsprit and a jib-stay. Moore, his contemporary, lays down the same distinction. Thus the real difference between the two craft was that the cutter could run in her bowsprit, whereas the sloop's spar was a standing one.

In the following chapter we shall go closely into the matter of those famous Revenue cutters which form one of the most romantic chapters in our maritime history. But before doing so it is necessary to straighten out our terms. For it happened that in the year 1785 the Board of Customs had a very interesting problem before them. In an important trial concerning a particular craft it was alleged that she had altered her character by the mere act of causing her "boltsprit" to be fixed, and not capable of being run inboard. All that had happened was that her owners had passed an iron bolt through the bits and heel of this spar, clenching it. The defence set up was that thus it had become a standing "boltsprit," and that

therefore the vessel became a sloop. However, the Crown contended that the vessel remained a cutter because such a fastening could be removed at pleasure. The jury also took that view, and so the craft was condemned.

But in 1795 there was an action brought by the Attorney-General to condemn the vessel *Mary* of Fowey, when the case turned on the question as to whether she was cutter or sloop rigged. Counsel for the prosecution defined the cutter as "a thing constructed for swift sailing, which, with a view to effect that purpose, is to sink prodigiously at her stern, and her head to be very much out of water . . . built so that she should measure a great deal more than she would contain." I think this barrister's definition must cause as much amusement to-day as it did then. But the judge gave the following as the difference: A standing or running bowsprit is common to either a sloop or a cutter, and a traveller is an invariable portion of a cutter's rig, so also is a jib-tack. He ruled that the jib-sheet however, differed: that of a cutter was twice as large as that of a sloop and was differently set, and had no stay. A sloop's jib-sheet was set with a fixed stay. Furthermore, in a cutter the tack of the jib was hooked to a traveller, and there was a large thimble fastened to a block which came across the head of the sail: there were two blocks on each side. "A rope passes through the three blocks by which it is drawn up to the halliards." The jib of a cutter "lets down and draws in a very short time." A cutter usually had channels and mortice-holes to fix legs to prevent oversetting.

Yes; we may well smile at all this unseamanlike language, and it is no wonder that confusion went on. But finally the lawyers had another go at the problem, and in 1822 the Attorney and Solicitor-General gave the following legal distinction, the matter having arisen in connection with the licensing of a vessel: "A cutter may have a standing bowsprit of a certain length without a licence, but the distinction between a sloop and a cutter should not be looked for in the rigging, but in the build and form of the hull, and, therefore, when a carvel-built vessel corresponds as to her hull with the usual form of a sloop, she will not merely, by having a running bowsprit, become a cutter within the meaning of the Act of the 24 Geo. III, cap. 47, and consequently will not be liable to forfeiture for want of a licence."

Thus, whilst Falconer and other nautical authorities relied on the fixing of the bowsprit for their definition, the legal authorities relied on the difference in hull. But let us leave these niceties to others and consider the cutters at sea.

CHAPTER XV

CUTTERS AND LUGGERS

IN the latter part of the eighteenth and the first part of the nineteenth centuries there were three distinct uses to which cutters were applied, quite apart from those engaged in trading or as pleasure craft.

In the Royal Navy, for example, cutters were used like the seventeenth-century Dutch "advys-jachts" as despatch vessels. It was the cutter *Viper*, you may remember, which before the battle of St. Vincent brought Jervis intelligence of the Spanish fleet. Cutters were also employed as packet ships carrying the mails across the English Channel and North Sea. These were not bigger than about 80 tons, and during the French wars they ran for a time between Great Yarmouth and Helvoetsluis in Holland. If we wish to visualise one of the cross-Channel cutters we have only to visit the National Gallery and regard Turner's well-known painting of the English packet entering Calais in 1803. But the third class consisted of those employed in the service against the smugglers. It is to the latter that we shall now especially address ourselves, for this service did more than any other in making the cutter such a powerful vessel.

And it was because the North Sea and English Channel were such active theatres for the smuggling industry that we find both in England and Holland pictures, models and

documentary information of these cutters, and of the luggers which so frequently eluded them. These cutters are really the mid-development between those Dutch-like Caroline yachts and those wonderful modern, fast, metre vessels of such beauty and speed with which all of us are so familiar.

To-day is the age of specialisation and particular concentration. Few people would think of going to a steamship builder in order to ask him to construct a 12-metre yacht. But in those old days of which we are speaking yards were comparatively few, shipbuilding data were scarce, and the heavy methods of the builder and designer of big ships had to suffice very often for these smaller craft. We find, too, in the single row of painted gun ports another similarity to big ship fashion. These funny old cutters were clinker-built, with heavy quarters, and the projecting stern was not a beautiful sweet-lined counter.

Now it was required of these Revenue cutters that they should be able to keep the sea in practically all weathers, that they should be able to carry guns and an adequate crew of seamen and gunners; but, also, that the vessels should have a good turn of speed for chasing the contraband craft. To make an effective compromise of these three important requisites was no easy matter, especially at a time when naval architecture was still in a somewhat primitive condition and experimental tanks had never been even thought of. Therefore we must not expect to find fine lined cutters but rather strong, serviceable ones able to stand the shock of cannon and the knocks which the North Sea and the Channel can deal in their fury.

These cutters, then, were big displacement ships, whose greatest draught of water was at the heel; and speed was aimed at by an exceptional amount of sail area. Let us think of these cutters with their long bowsprits, lofty top-masts, long booms and lengthy yards. Imagine a smuggler's lugger being descried a long way to leeward, with a good chance of landing her brandy before being interfered with. What amount of canvas can the chasing Revenue cutter set? Well, it was no exception for her to have as many as ten different sails, all drawing at the same time if the wind was on the quarter. Reckoning from for'ard, these ten were: jib, fore staysail, a square-sail for'ard of the mast, with square topsail and even square t'gallant sail. Square stuns'l's were also set on either side of the square topsail; and a curious triangular, or rather quadrilateral, sail was set between the foot of the square topsail and above the yard of the lower course. The object of this unusual sail was to fill up the spacious curve left by the goaring of the topsail along the foot. But in addition to these eight there was not merely the fore-and-aft mainsail, but a ring-tail set abaft the latter's leach. We can well imagine that the sight of this cliff of canvas coming over the sea would make even the most daring smuggler nervous. In light airs an additional headsail was also set from the top-mast.

Some of these craft were of 139 tons, there were cat-heads on either bow, and the dinghy was often carried over the stern just as we still see in some of the Baltic sailing vessels to-day. The anchors were carried over the side after the

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fashion of big ships, and the cables were of hemp. Great attention was paid to the strength of the shrouds, backstays and runners, and four pairs of dead-eyes on either side were not unusual.

The three-masted lugger represents a typical specimen of the big smuggler craft, and these vessels reaching were very fast and difficult for the Revenue cutters to overtake. And we can hardly wish for better evidence of their speed than the fact that the British Government were finally compelled to build and arm similar luggers themselves. Such craft carried as many as seven sails, thus: a jib was sometimes set, and on the foremast, which was in the very eyes of the ship, was a dipping lug with topsail, similarly on the mainmast. The mizzen-mast set a lug with outrigger and topsail. It is interesting to note that such craft had topmasts. In these naval craft the rigging was very strong, as indeed was necessary considering the way sail had sometimes to be carried in hard winds.

It was from about the year 1700 to about 1855 that the greatest smuggling activity existed in regard to the areas mentioned, and during that period the competition between the Crown ships and the adventurers was very keen. It was a battle of wits no less than of seamanship, armed fists, guns, and cutlasses. There were deaths and narrow escapes, and some ingenious bits of bluff, for it must not be thought that the Government ships or officials were by any means always successful. It was an age when fore-and-aft seamanship reached a very high state of efficiency on both sides, and some of the best yacht skippers and hands to-day can

trace their ancestry back to the men in the luggers who outwitted the Revenue cutters.

The daring of certain smugglers was sometimes as amazing as their impudence, and there is at least one case where the smuggler turned his own swivel guns on to the King's cutter, caused the latter to flee, and the smuggler even chased him. During the year 1777 one of the Customs officers complained that a large lugger operating off the English coast was so powerfully armed that she was superior even to a couple of Revenue cutters. To such lengths did the contraband men go that in another case a smuggler came into a certain bay, and finding the Revenue cutter there lying, ordered her to cut cable and clear out, under threat of being sunk. And, believe me, the cutter weighed his anchor and did clear out quickly! Such a condition of affairs seems to us amazing; but those were desperate times, and the characters of the smugglers were desperate. Wages were low, the cost of living, for the poorer classes especially, was high, and in some coastal districts—Kent and Sussex for instance—smuggling had been going on from father to son for centuries. The sympathy of the people ashore was almost wholeheartedly with the smugglers; and, in the case of arrests, magistrates were frequently terrorised and juries dared not convict. The result was obvious: smuggling became worse than ever. And some of those comfortable and imposing old-fashioned houses which one sees as one sails past the south and south-east coast of England were actually built out of proceeds that came as interest on the capital expended: for all sorts of people, rich and poor, high and low, the squire

and the farmer, the labourer and the fisherman, were all in the great adventure.

It was not until the year 1815 that the Government began to get the upper hand over this ancient and illegal practice ; but what gave the biggest blow of all was the mid-nineteenth century adoption of Scotch whisky in preference to French brandy as an alcoholic stimulant. And what encouraged the smugglers for such a long time were the slackness and inefficiency and extraordinary lack of zeal on the part of both officers and crews in some Revenue cutters. I have come across many of these unfortunate instances, but perhaps no one knew more about the slovenliness of this service than Captain Marryat, who himself served for a time in such craft.

Two passages may be cited to bear this out. The first is from *Peter Simple*. "I thought so," observed the captain ; "I judged as much from your appearance. An officer who is so careless of his dress as not even to put on a decent coat when he appears at his examination generally turns out an idle fellow, and no seaman. One would think you had served all your time in a cutter, or a ten-gun brig, instead of dashing frigates." And again, in *The Three Cutters*, Marryat refers to the midshipman of the Revenue cutter *Active* as a lazy fellow, too inert even to mend his out-at-elbows jacket. "He has been turned out of half the ships in the service for laziness ; but he was born so, and therefore it is not his fault. A revenue cutter suits him—she is half her time hove-to ; and he has no objection to boat-service, as he sits down in the stern-sheets, which is not fatiguing.

Creeping for tubs is his delight, as he gets over so little ground."

In the year 1784 there were forty-five of these cutters, each carrying a crew of from eleven to thirty-one, employed watching the coast between Newcastle and the Scillies. Some of these craft were owned by the Crown, but others were employed by contract. From a list of such craft thirteen years later we are able to see that some of them were of quite large size. The *Greyhound*, which patrolled between Beachy Head and the Start, was the biggest, being of 200 tons. But there were several others not so much smaller, such as the *Hinde*, whose beat was from Portland to St. Ives and the Scillies; the *Stag* which cruised between Dover and Brighton; the *Argus* whose area was from the Swin Middle to Lowestoft. The *Greyhound* carried a crew of forty-three and mounted sixteen guns; so she was a powerful vessel to meet.

Between the years 1822 and 1838 a large number of these Revenue cutters was built at such places as Cowes, Lymington, Hastings, Dover, Bridport, Folkestone, Sandgate, Rye, and Poole; but Thomas White of Cowes and Thomas Inman of Lymington were especially popular with the Board of Customs and received the most orders, though Ransom and Ridley of Hastings ran them fairly close. The latter, for instance, in 1828 built the *Diligence*, afterwards lost. This was a 171-ton cutter drawing 6 ft. 9 in. forward and 12 ft. 4 in. aft. Some of White's Cowes-built Revenue cutters were the 169-ton *Hound* of the year 1825, also lost, and the 130-ton *Stag*, which had a reputed speed of

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10 knots. Inman was responsible for the construction of such able cutters as the 114-ton *Victoria*, which could do her 11 knots, and the 149-ton *Royal George*, built in 1834, which was slightly faster. But there were plenty of smaller craft of all sizes down to 18 tons. In that same year 1834 was added to the Revenue fleet their first steamer, the *Vulcan*, a vessel of 325 tons, also built by White.

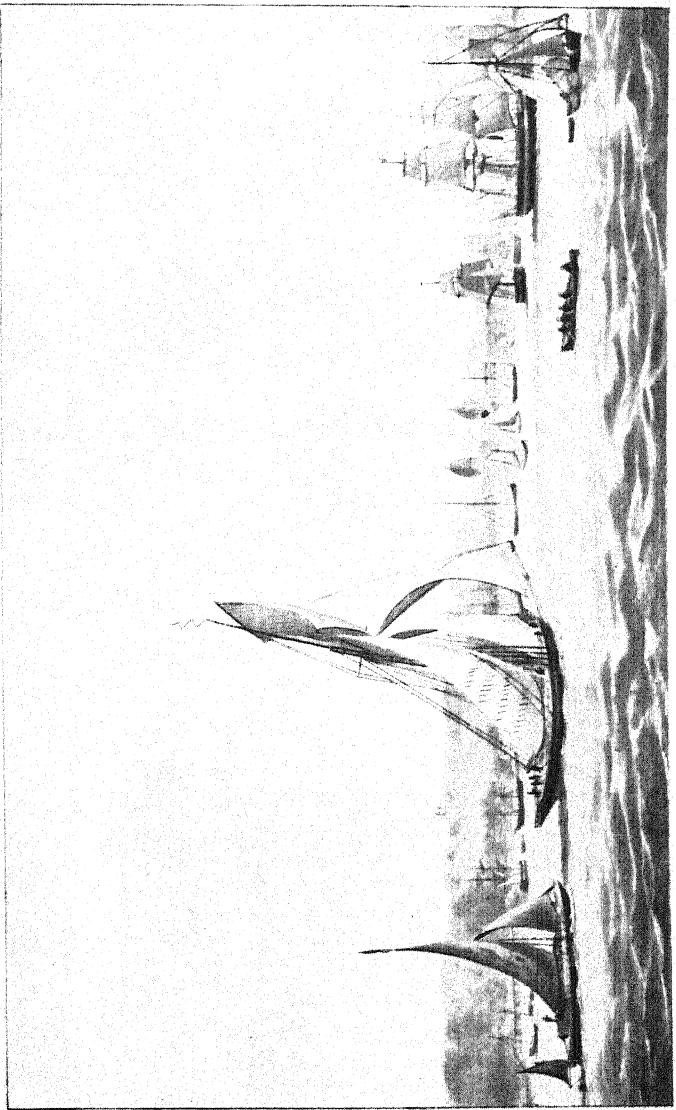
Fortunately we have the specifications of an average 35-ton Revenue cutter, such as was constructed for the service in the year 1838, and I think many fore-and-aft sailors may care to compare some of these details with modern yacht-building practice. Here was a vessel which necessarily had to have all the strength and speed and seaworthiness that existing knowledge could provide. She measured from stem to sternpost 44 ft., extreme beam 14 ft. 5 in. Depth from upper part of main hatch-beam to ceiling alongside keelson, 7 ft. 8 in. The keel was of good sound elm, and consisted of not more than two pieces, the stem of English oak. The floors were of English oak and not more than 6 in. apart. The garboard strake and the one next to it were of elm 2 in. thick when worked. All the other planking was either $2\frac{1}{2}$ or 3 in. oak. The deck was of red pine a good 2 in. thick when worked, and each deck-plank was not more than 5 in. broad, with an under planking of $2\frac{1}{2}$ in. oak, fastened with copper nails.

This craft was fitted with a windlass and chain cable, main hatch, and two glass sky-lights. Round the mast was a patent winch. The magazine was aft lined with lead, and with double doors, the bread rooms and flour-

bins being lined with tin. The fastenings of the planking were treenails well seasoned. All woodwork inside and out was given three coats of best paint. The cutter was to remain in frame for one month before being closed in, and the timbers were given a good coat of Stockholm tar. Copper sheathing was used outside the hull.

In the case of a 150-ton Revenue cutter the length (stem to sternpost) was 72 ft., extreme beam 22 ft. 10 in., depth 10 ft. 3 in., height of mast 75 ft., length of boom 61 ft. ; but the topmast measured 53 ft. and bowsprit 55 ft. In comparing these mast-lengths with those of modern yachts we have of course to remember that strength and seaworthiness, and ability to keep on patrol were of importance greater than speed. The yard which carried the square-sail was known as the "spread-yard," and we can get some idea of the spread from the length of this yard. In the case of a 150-ton cutter it was 58 ft. ; in the 40-tonners it was 32 ft. This yard worked up and down the mast with parrels, and when not in use was lowered not fore-and-aft wise but athwart ship, well clear of the crew's heads.

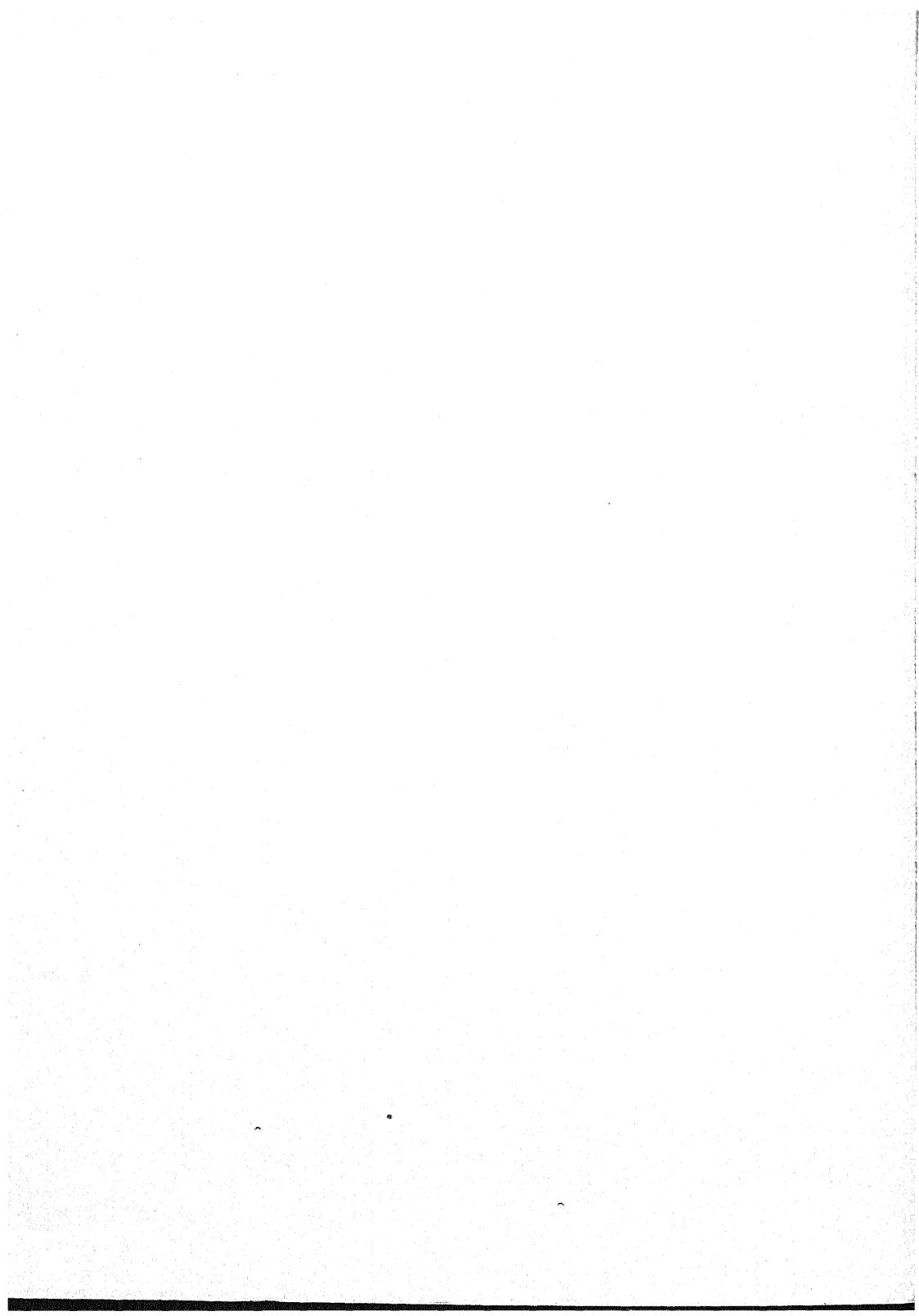
So much then for the details of these interesting and historic cutters, about which we could continue to inquire with the same fascinating incentive which every kind of ship holds out to us. Sailmaking had not yet reached its scientific stage, but if we are to judge from contemporary illustrations the canvas was very heavy. The mainsail was loose-footed, and the fore-and-aft topsail had a small yard not unlike that of the modern Thames barge. But we know from Marryat what a Revenue cutter of the early



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H.M. Revenue Cutter *Vigilant* on December 13, 1849, towing in the captured slave barge *Charlotte*, which had nearly 7 tons of contraband tobacco concealed under straw.

(From a lithograph by W. G. Burtton.)



nineteenth century looked like. "She is a cutter," the novelist wrote in *The Three Cutters*, "and you may know that she belongs to the Preventive Service by the number of gigs and galleys which she has hoisted up all round her. She looks like a vessel that was about to sail with a cargo of boats: two on deck, one astern, one on each side of her. You observe that she is painted black, and all her boats are white. She is not such an elegant vessel as the yacht, and she is much lumbered up. . . . Let us go on board. You observe the guns are iron, and painted black, and her bulwarks are painted red; it is not a very becoming colour, but then it lasts a long while, and the dockyard is not very generous on the score of paint. . . . She has plenty of men, and fine men they are; all dressed in red flannel shirts and blue trousers; some of them have not taken off their canvas or tarpaulin petticoats, which are very useful to them, as they are in the boats night and day, and in all weathers. But we will at once go down into the cabin, where we shall find the lieutenant who commands her, a master's mate, and a midshipman. They have each their tumbler before them, and are drinking gin-toddy, hot with sugar—capital gin, too, 'bove proof; it is from that small anker standing under the table. It was one that they forgot to return to the Custom House when they made their last seizure."

It was a regulation that before firing on a smuggler craft the Revenue cutter was bound to hoist Revenue colours, both pennant and ensign, whether it were day or night. Nor were the smuggling vessels always luggers. One of

the worst offenders in the late eighteenth century was the 100-ton cutter *Swift* belonging to that little West Bay harbour Bridport. This ship was armed with 16 guns and carried a crew of 50, and during the year 1783 made a number of successful runs from the other side of the Channel to the neighbourhood of Torbay, on each occasion landing about 2,000 casks of spirits and four or five tons of tea. The *Ranger* was bigger still, being of 250 tons. She had a crew of 100, and mounted 22 guns. Built at Cawsand, which was a notorious smuggling fraternity, she also used to operate to the east of Torbay.

How did these smugglers manage to get their cargoes ashore, seeing that the coast was so well arranged for being patrolled by these cutters? The answer is, firstly, that there were a number of ingenious devices which would take too long to be related here. But, secondly, those patrols existed sometimes only on paper. Some of the Revenue commanding officers were a little too apt to leave their area and run into port either in case of bad weather or for imaginary repairs supposed to be needed. That was just the chance for the lugger whose friends ashore were able to signal that the coast was clear. It was because of such happenings that the cutter's commanding officer was compelled later on both to give his reasons for coming into port and to say how long he was likely to remain there.

In July of the year 1788 the cutter *Kite* had an exciting chase with a smuggler lugger which well illustrates the kind of operations that went on. The *Kite* this summer evening was between Peveril Point and St. Alban's Head

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when a lugger was sighted about nine miles to the W.S.W. steering E.S.E. The cutter gave chase about 8 p.m. and this went on for three hours, the wind being moderate S.W. The cutter was reefed, but on seeing the lugger hoist her topsail, the *Kite* shook out her reefs and set her gaff topsail. About 11 p.m. the *Kite* was fast overhauling her, although the lugger had luffed up an extra point nearer the wind and increased her speed. As the *Kite* got closer she hoisted her Revenue colours and fired a musket-shot. This was a signal for the smuggler to heave to, but the latter still held on. The *Kite* then fired her swivel-gun several times, and when near enough hailed the lugger, informing her that the *Kite* was a King's cutter.

This, too, was ignored, and then at close range *Kite* attacked with her muskets. The lugger now saw that the game was up, so came round under the cutter's stern and then the latter lowered a boat and fetched the lugger's master aboard. He turned out to be a very notorious person named David Browning, alias "Smoker," who had been wanted in the North Sea for a long time. He admitted that he was bound for Flushing, and obviously he had just landed a cargo on the beach. The lugger was found to be decked and clinker-built with a running bowsprit on which she set a jib. She was well armed with half a dozen carriage guns, and four were already loaded. However, Browning was tried and convicted, and in the meantime the lugger was sent on to Spithead with a prize crew in charge of the midshipman.

Those days seem to belong much nearer to the Middle

THE SHIP UNDER SAIL

Ages than our own. But whatever we have to say of that period we can never forget that it did much for both cutter and lugger seamanship, as well as giving that welcome impetus to those smaller shipbuilding firms which presently were to develop into famous yacht-builders. It is in this wise that the yachtsman owes so much to the old-time smuggler.

CHAPTER XVI

PROGRESS OF THE FORE-AND-AFT RIG

AFTER a while, with the advance of thought and the quickening of life, all that love of pomp and display which had been so characteristic of the eighteenth century gave way. Owners began to desire yachts out of sheer love for the sea, and for no other reason. They wanted to race occasionally and they wished to cruise along the coast, instead of ceremoniously processing out of harbour and back again. The effect of Victoria's reign was to speed up matters industrially and socially. Development was in the air, industrialism was beginning to modify thoughts and conditions of existence, steam navigation was opening up world commerce, the clipper ships were making wonderful records, the blessings of peace after generations of wars had all begun to alter the outlook on life.

Thus yacht-building was becoming a new speciality, just as the building of Revenue cutters was no longer required. Therefore, it was natural enough in many cases that those yards which had been building fast Government cutters, or pilot cutters, or fishing craft should now construct yachts. These Revenue and smuggling cutters certainly did influence the type of yacht in the mid-Victorian period ; in fact, it needed a good deal to overcome this conservatism. And the

immense improvements which have taken place in this present generation respecting design, rigging, and sails are such that we hardly appreciate what a great change has been accomplished during such a brief period. Like everything else, we have caused all that concerns the yacht to be a separate division of its own : concentration and specialisation have been the guiding principles.

At first the yachtsman had either to purchase an ex-Revenue craft, just as many owners after the recent abolition of the Bristol Channel pilot fleet have bought those sturdy craft for pleasure purposes. And we have a splendid instance of the similarity between yachts and smugglers and Revenue cutters of the 'fifties revealed in the following. During the year 1850 there was a very notorious French sloop named the *Georges*, which used to have a fine old time smuggling goods across the Channel to the southern English ports. In April that year she was sighted one afternoon off Bembridge Ledge by the Revenue cutter *Cameleon* ; but after being rummaged, the *Georges* seemed to have no illicit cargo aboard, and was reluctantly released, although certain suspicious articles were discovered.

But during the following month the *Georges* arrived off Ryde from the other side of the Channel with five Frenchmen aboard, and later was sighted off Bembridge Ledge once more. Here she was boarded by the Revenue cutter *Petrel* and nothing was found of a suspicious nature, except that there was a strong smell of brandy in the ship. It certainly was a little curious, and the Revenue people were pretty convinced that this craft had been brandy running, but there

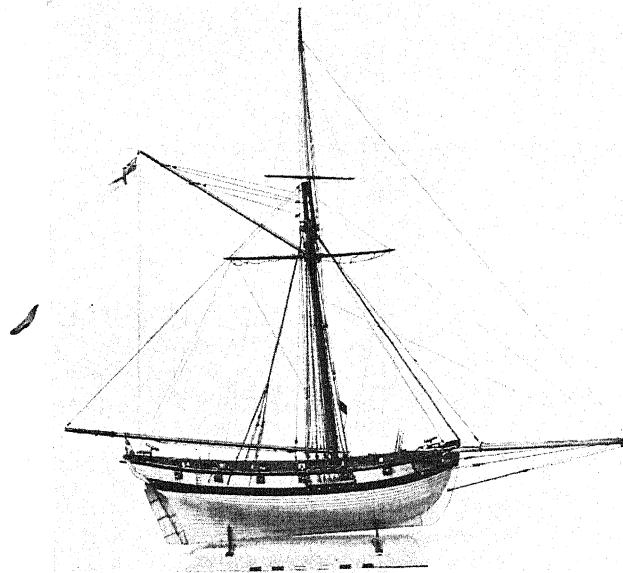
was positively nothing tangible to prove it. However, a week later the *Georges* came across from France to Torbay, and again it was not quite possible to bring guilt home to her. But a very careful look-out was kept, and on the night of August 2 the flashes of pistols were seen in the neighbourhood of Sidmouth, so that presently two carts with tubs of brandy were discovered, escorted by fifteen men at midnight. To make short a long story, on the following evening these signal flashes were repeated, and the smuggler *Georges*, sloop rigged, was caught in the very act of putting the brandy tubs over the side where they would be buoyed for the associates ashore to discover at their convenience. Indeed, later on that buoy, complete with grapnel, was discovered.

Now the point of this story is that when the *Georges* was arrested, she was found to be a handsome and almost new vessel. She was described by the captors as possessing "very much the appearance of a yacht, and carries a white burgee at her masthead with a red cross in it, similar to vessels belonging to the Yacht Club." The "Yacht Club" was of course the Royal Yacht Club, afterwards known as the Royal Yacht Squadron. And it is significant that a yacht and a smuggler were so exactly alike in rig and hull. Nor is this the only instance, for, as readers may be aware, and as contemporary pictures show, some yacht owners in those days, when crews' wages were cheap, used to have their craft rigged as three-masted luggers with dipping lugs on the first two masts, and a bowsprit with enormous jib. These yachts were in fact designed on the lines of smuggling luggers and were very fast reaching. The gentle smuggler appreci-

ated the compliment of having his rig and hull copied by pretending in turn that he was a yacht! And two or three years before Victoria came to the throne, when the Revenue cutter *Prince of Wales* captured the smuggling lugger *Maria* there was found on board the Royal Yacht Club's burgee, and one of *Maria*'s crew frankly admitted they had it on board as it might be serviceable in their plans of smuggling. As to that other craft, the *Georges*, she was found to be of such a lovely model, and so beautifully built, that she was actually taken into the Revenue service.

Thus the cutter or sloop and yacht were very similar, whether owned by sportsmen, smugglers, or the Government. Heavily built and somewhat clumsy, they were given enormous sail-areas. Often there arose the amusing circumstances of a smuggling craft and a Revenue cutter being built at the same yard, side by side. And if, presently, the smuggler turned out the faster craft, the Government was willing to pay the builder a handsome premium in order to take her. And then, as yachts began to improve in design and speed, the Government began to find that they were being left behind, so they even arranged for a match between a cutter yacht and a Revenue cutter, in which the yacht won so decisively that her design was copied by the Government department. Thus the influence was mutual.

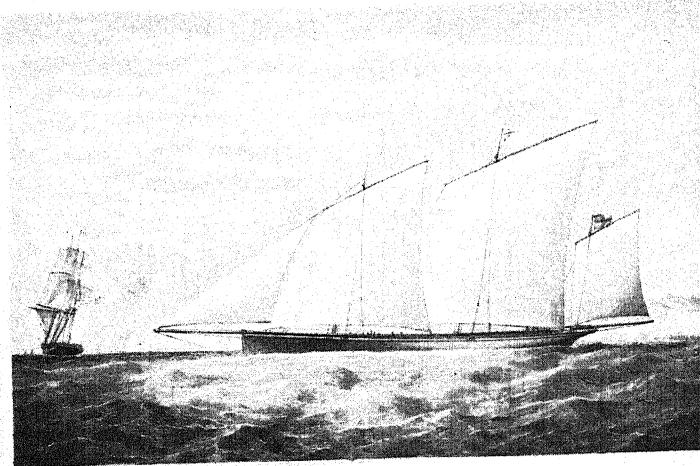
During the 'fifties Thomas Wanhill of Poole introduced the raking sternpost into yachts, and generally the design and equipment of these cutters were improving. For a long time ballast of stones and gravel was used, but in spite of violent criticism lead began to be used internally. The



ENGLISH REVENUE CUTTER.

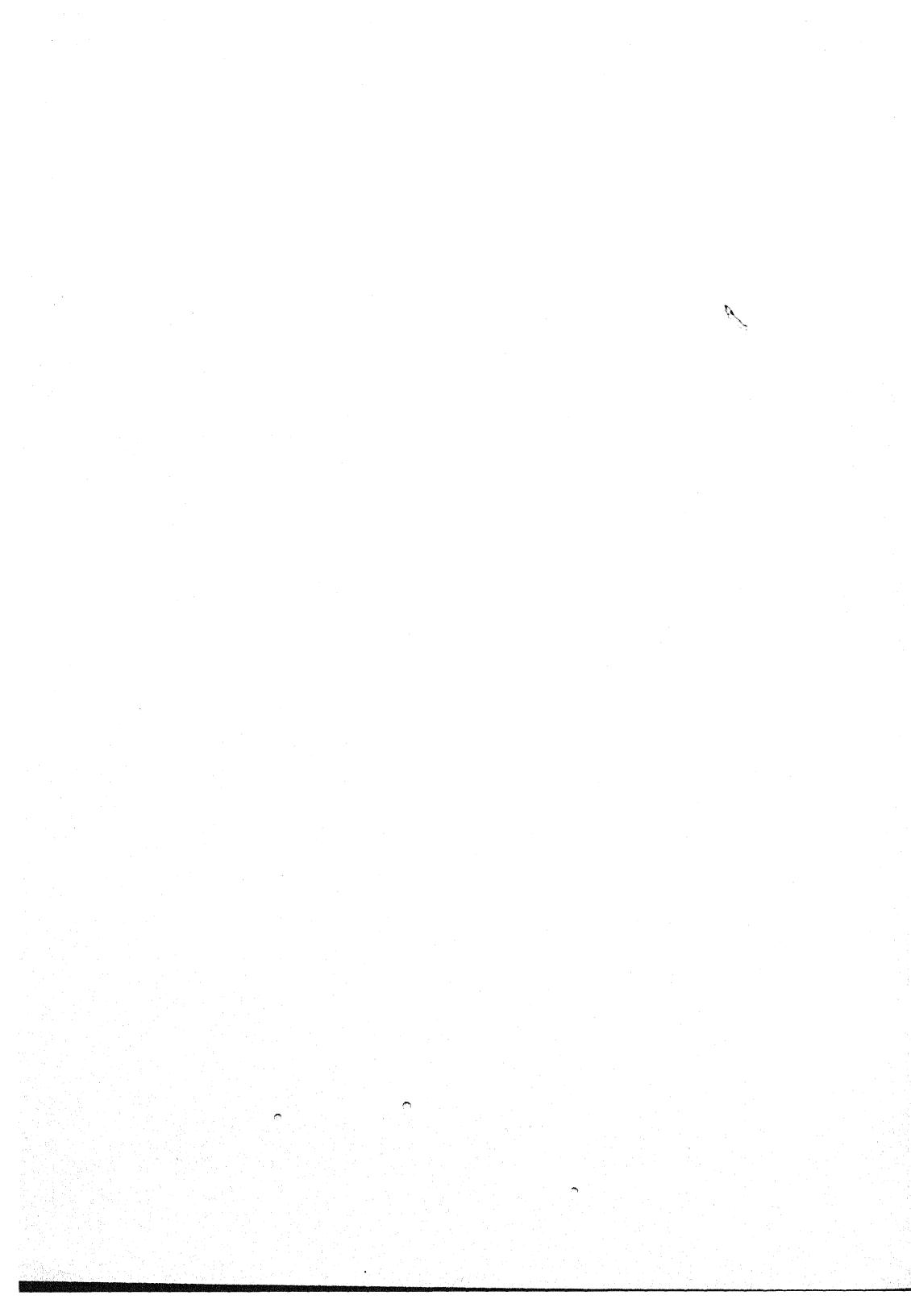
of the period 1810-30. Length, 85 feet; beam, 24 feet; depth, 13-3 feet;
130 tons. Armed with 14 guns and 3 swivels.

(Model in Science Museum, South Kensington.)



NEW MOON.

Showing the application of the lugger rig to yachts. The *New Moon* was of 220 tons
and built at Hastings.
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old men insisted that lead would strain the ship and make her a bad sea boat, but this was ignored ; and then the lead was put outside below the keel. The design of hull began to be improved in getting further and further away from the Dutch model, so that the yachts became less tubby, with less beam and greater draught. Still, as one examines these mid-Victorian yachts, one sees how precious little the sail plan with its long spars had altered. But now a new influence was to come.

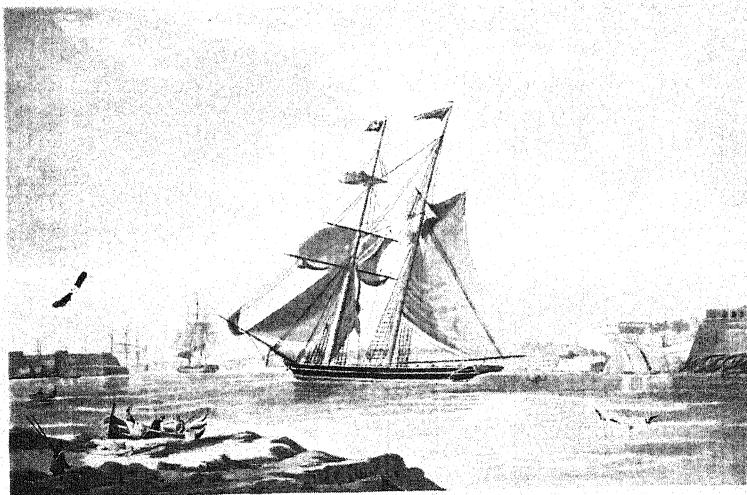
In North America there was being evolved a very wonderful schooner, and Gloucester was its place of origin. It had to be very seaworthy, for the Gloucester fishermen work in all Atlantic weathers. It had to be fast, because the fish had to be hurried a long way into port. On these lines were built a number of pilot schooners, and George Steers of New York was especially famous for the design of these. Someone in that country decided that a schooner yacht of this kind would be a great idea, so Steers was commissioned to build her and in 1851 she was launched. This was the first historic *America*, and that year she sailed across the Atlantic, and won the special cup offered by the Royal Yacht Squadron against the finest cutters and schooner yachts that England then owned. This cup, as we all know, was presented afterwards by the owners of *America* to the New York Yacht Club as a challenge trophy, and has not yet been brought back to England.

But the *America* caused a great influence on British yachting with her small displacement, small midship sectional area, but especially in regard to her well-cut sails, instead of

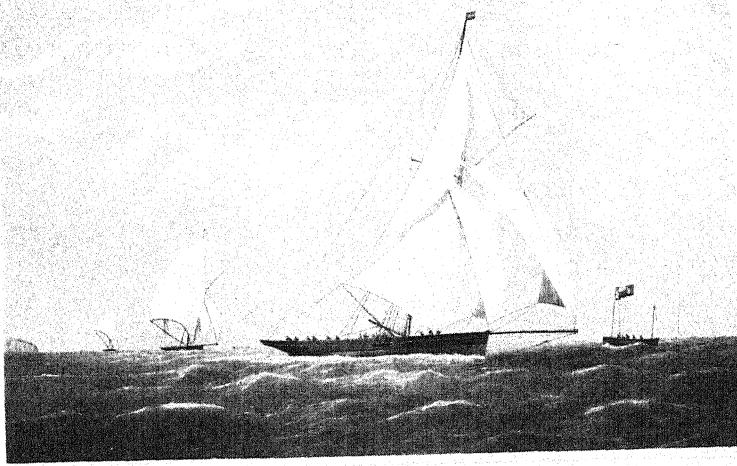
those wind-bags which had been used by us for so many generations. As one examines the contemporary prints of *America* and British yachts, the difference in the set of canvas is remarkable. In 1834 there had been built the typical old-fashioned cutter *Alarm*, a vessel of 193 tons. But in 1852, as a result of the *America*'s success, the *Alarm* was lengthened 20 feet, and turned into a schooner, and given a suit of well-fitting, flat sails. The many existing prints of her show that she carried no topsails, and only one enormous single headsail working up and down the stay. But the set of jib, foresail, and mainsail is well-nigh perfect.

From now on British yachts were to receive better cut sails, and thanks also to those two vessels, better hulls were to evolve. There came also a certain popularity for the schooner as a yacht, with clipper bows, for the famous tea-carriers were soon to pile up their wonderful records. During the 'sixties the yawl rig came into fashion as a kind of compromise between the schooner and the cutter. Between 1870 and 1880 we still see the big spars, the great sail spread and the deep topsails in the yachts that were built and raced. Even in the straight stem and in the design of the counter we can still see a relationship to the Revenue cutters. One of the best-known cutters of the 'sixties was the *Oimara*. The *Aline* was the first yacht to discard the rake of mast; and now in this twentieth century we have returned to this mast-rake in our crack metre craft.

It was in the 'seventies that yachting prospered exceedingly, and there came into existence those famous forty-tonners of which the *Bloodhound* was such a good example.



BRITISH SCHOONER *MARY*.
Of the year 1835.



CUTTER YACHT *ARROW*, 117 TONS.
Winning the race at the Royal Cinque Ports Yacht Club Regatta off Dover, June 24, 1876.

2
3

But the year 1875 will always be memorable for the birth of that epoch-making *Jullanar*, with a design that was a long time ahead of her period. This 126-ton yawl with a kind of canoe stern, but a bow reminiscent of the contemporary clipper ships, was to spread an influence on yacht design comparable only to that of the *America*, a quarter of a century before. Mr. G. L. Watson was himself greatly moved by this interesting model, but the most remarkable thing of all was that *Jullanar's* designer, Mr. E. H. Benthall, was not a professional naval architect. In this craft, with her great length and overhang and easy lines, there was a vast breaking away from the old smuggler-Revenue-cutter type. The dimensions of this novel yacht were : length over all $110\frac{1}{2}$ ft., beam 16·6 ft., draught $13\frac{1}{2}$ ft. It is, however, to be recorded that this seems to have been a lucky inspiration ; for when Benthall designed another craft called the *Evolution*, she resembled nothing so much as a coffin, and a very ugly one at that.

But in *Jullanar* we have the beginning of that overhang which became fashionable in the 'nineties, and to-day has attained such universal approval in regard to racing yachts especially. Thus, if the reader will cast his mind back to the first chapter in our present subject, and consider for a moment those early Egyptian ships, we find yet again a repetition of history : for the overhang even in its extreme application is as old as those ancient Nile sailing craft. To-day the cruising yacht, with its square-sail for running, is merely going back a little nearer to the Revenue cutters of Holland and England.

It was in 1875 that the Yacht Racing Association was founded, and this body has been the cause of modifying and even improving the design of yachts. Measurement rules cannot, however, be said always to have been healthy in the progress of these yachts. From the old time beamy, tubby craft to the "plank-on-edge" type was of course a reaction which we can understand well enough. Six beams to the length, with heavy external lead ballast, produced a vessel that could be driven along yet was hardly a comfortable floating home. But if beam were penalised, depth had to come. Afterwards, when this plank-on-edge enthusiasm passed, there evolved those fine cutters *Queen Mab* and *Corsair*, which many of us remember in our younger days with admiration and joy.

Modern yachting really dates from the 'nineties, when it became more democratic and universal. Primarily it had been a sport for big craft owned by wealthy men. But now smaller yachts were required much more frequently by those who could not afford a big wage bill and had no desire to race. It is this section which, under post-war economic conditions, seems to be singularly hopeful when we look into the future. Within recent years the number of fine and lengthy cruises performed by quite small yachts is something of which the sport may well be proud; they would certainly astonish some of the Victorian owners of much bigger craft. Nowadays, without professional assistance small yachts cruise to the Baltic, to the Bay of Biscay, the Mediterranean, across the Atlantic, and even round the world. We are beginning to think more wisely and

to go back to those mediæval and Tudor days when little ships made big voyages. One of the results of the advent of the clippers and the systematised steamships with their regular sea lanes was to encourage an idea that the ocean was safe only for large craft. But now this has long since been shown not to be true by the pioneer voyages of Slocum, Voss, and others. With any luck and with a good hull, well rigged and well handled, small craft are capable of going anywhere. We are only just realising it. Muhlhauser, in the *Amaryllis*, brought this home to us by his 31,000 miles' voyage; and O'Brien and Stock have proved that ocean cruising is the sphere of amateurs as well as professionals. Could anything be more amazing than Gerbault's single-handed trip from the Mediterranean to the United States?

And speaking of Voss reminds me of a remark which he once made in England. A number of keen yachtsmen once invited him down to a certain port, and Voss went out sailing. One of my friends who was present told me that after a while Voss turned round and delivered himself of the following remark: "Gentlemen," he addressed these amateur week-enders, "I like your little yachts; I consider them splendid little seaboats. But what I don't understand is why some of you don't take a voyage in them down to the Azores and back." Now that suggestion caused amazement and amusement at the time; but it was many years ago, and since then much longer trips in equally small yachts have been carried out.

Some of the old fore-and-aft types are dying out, and

even in Dutch waters the motor engine has created an entirely new chapter in shipping and sail. One of the strangest sights to be seen anywhere in Europe is that motley collection of craft emerging from, say, Flushing Lock, when the gates are pushed open. You get iron-built "klipper-aaks," motor barges, white-hulled cutter yachts, a steam tug; but mixed up with these come those solemn, robust, apple-bowed, multi-painted tjalks whose rig and hull have remained so little altered since the days of Charles II's first yacht, that it is almost as if the vessels out of some seventeenth-century Dutch painting had sailed forth into real water and become tangible. Nowhere do we find marine conservatism so persistently preserved.

In England, just as we have long ago banished the last brig, so the cobble which used to be such a feature of the east coast as far south as Great Yarmouth is one of those types which are getting fewer. In the fishing fleets—Brixham always excepted—the days of sail have either gone or are going rapidly at many ports. Grimsby, once the home of many fine sailing fishing vessels, has been devoted entirely to steam for years before the war. Many of us recollect that famous fleet which used to sail out of Yarmouth: that, too, is gone. Steam trawlers, steam drifters, crabbers under motor power—that is the new tendency and development of the fore-and-aft rig as applied to fishing. But again history has begun to repeat itself; for with the recent abolition of the coastguards has come back that old smuggling practice, and thus once again sailing craft have crossed the English Channel stealthily,

PROGRESS OF THE FORE-AND-AFT RIG

and landed their cargo illicitly. Who knows but that before very long no one will be using sail except yachtsmen, and perhaps a few coasters? Pilots and fishermen have taken to mechanical power, the village boys prefer to become motor mechanics at the local garage rather than be apprenticed to the sea. But for all that, for all the modern benefits of machinery, there will ever be some men to whom the sea will never call in vain; to whom the feel of a tiller and the sight of well-drawing canvas and the sensation of the salt spray on the skin is one of those joys that no thrill in the world can ever overwhelm for sheer, pure delight.

CHAPTER XVII

THE FORE-AND-AFTERS FINALLY

IN that great family of the ship there is no such thing as a thorough-bred. Like national history itself, every craft is a mixture of so many different influences. Thus every British or American fore-and-after to-day can trace its origin through Holland and Scandinavian ancestry like the owners themselves. The cutter, the sloop, the ketch, and the schooner are all essentially North European.

The influence of the Norwegians and the Dutch buss-ships on the fishing vessels of Scotland is equally real, but especially up till about sixty years ago. The square-sail has long since become the lug, but the hull still shows the Norse fashion modified for local usage. Up the Humber and the Trent we still see to-day those "keels" gliding along under one huge square-sail with sometimes square topsail, too. During the war one saw many of them trading up and down the strong tideway of the Humber; and in this craft there survives the square rig in its least modified form direct from Viking times.

The Yorkshire cobbles alluded to in the previous chapter are also Norse-descended, and probably of all British small craft the most difficult to handle. Designed for use where the beach is long and shelving, they are very shallow right aft and hauled ashore stern first, with the greatest depth

THE FORE-AND-AFTERS FINALLY

forward. Splendid going to windward or on a reach, they are dangerous things running except when in charge of a man from the coast of Yorkshire, Northumberland, or Durham, for they gripe badly and have a tendency to broach to. The rudder is a very deep affair, coming down several feet below the keel. Clinker built, the smaller type is about 28 ft. long, with only $2\frac{1}{4}$ ft. depth; the bigger type measuring 34 ft. and drawing $4\frac{3}{4}$ ft.

There can be little doubt that the Thames bawley derives its ancestry from the Dutch yachts and traders seen in the London river from the time of Charles II. The boomless mainsail, with its brails, is one of those interesting historic survivals which can not be ignored if we are fascinated by this subject of ship evolution. But it is in that wonderful thing, the Thames sailing barge, that Holland still especially shows herself, and the rig still maintains its seventeenth-century conservatism to a degree that is surprising. And yet, when we consider the similarity of conditions, the shallowness of the estuaries, and the narrow channels through which the craft on both sides have to twist and turn, yet be able to carry on in hard weather or take the ground where the tide dries out, it is but natural enough that for similar work under similar circumstances there should be so much likeness in common. Thus, when the Thames barge is sent across the North Sea to wriggle her way up some river and load up, miles inland from the sea, with a cargo of, say glass bottles, returning alongside some London wharf where there is barely water enough to float at the top of the tide, we see the Dutch type employed

with full use of her peculiarities. And who can deny that with his consummate art of tide-cheating and ditch-crawling, the London barge skipper is one of the finest skilled seamen afloat, one of the few survivors of a dying age ?

The Deal lugger, on the other hand, owes much of her ancestry to her neighbours on the opposite side of the Channel, but further back than that comes the North Sea buss-ship ; and, further still, the Viking type with its single square-sail. But even more does it owe to that unbroken seamanship which has been handed down from father and son to the present phase of motors. It is the Bristol Channel pilot cutter, with her perfect sail balance and patent reefing gear and wholesome hull, which may be regarded as the final expression of the most perfect bad weather fore-and-after, having regard to rig and size. In her we have a marvellous compromise of speed, handiness, seaworthiness, comfort in a seaway, power. She is extreme in nothing. But in her we have summed up at the end of long lineage all the advantages of the first Dutch yachts, all the lessons which could be learnt from the old Revenue cutters, together with much that has evolved through the practice of yachtbuilding and the sport of fore-and-aft seamanship. And the pity of it was that just when this ideal type had at last been evolved and proved its worth, steam should have swept it out of the Bristol Channel as no longer required.

In the evolution of the first modern yacht, certainly the most important craft has been that ever young royal cutter *Britannia*, one of the greatest achievements of the

1890's, and after thirty years' service still afloat and still able to hold her own against the most recent racing cutters. The spoon-shaped bow had come via the fiddle-bow, and from the old-fashioned straight stem, but who would have imagined that we should attain such tremendous overhangs as we see in any regatta to-day? Thus the modern development of the yacht has proceeded on two specialised and different lines. In racing we have produced a craft that is a triumph of science and art. Lightness with strength, rigging mathematically perfect to withstand required strains, a hull that glides through the water with the least possible fuss; a high, narrow sail plan with every part of the canvas texture drawing, hollow masts for further lightness, the so-called Bermudian mainsail with no gaff aloft, wonderful gadgets and spreaders for the hollow masts —it is all the result of what has gone before through many generations, yet with all the advantages which modern research has been able to afford. Stream lines, scientific data, wind resistance theories, and a thousand other matters have entered into the amazing production which is doing her best to forget that her parent was once a tubby, clumsy thing with lee-boards and heavy quarters and gilded classical figures moulded at the stern. I once heard the expression that of the two most wonderful things to-day the sight of a modern yacht working against the wind, beating her way against nature, was the most amazing and impressive. Certainly as we watch the *Shamrocks* and *White Heathers* and *Lulworths*, and the 12-metres or their smaller sisters, we are looking not at mere ships but at

wonderful works of art. Beautiful as a piece of exquisite statuary, they have the strength and endurance of a man. And if we have lost from the sea the old full-rigged ship with her yards and picturesqueness, we have given something not less wonderful and certainly not less handsome in another way.

But there are those to whom the influence of the cut-away fast cutter does not appeal for ordinary cruising. And here, again, the ideals are two. There is the enthusiast who is content with the pilot model; there is the man who prefers the canoe stern which the late Albert Strange, an artist by profession and expression, did much to introduce; and there is the modern Norwegian "redningskoite" type which was the outcome of the late Colin Archer, himself really a Scotsman but living abroad. Along the principles enunciated in what we may conveniently call the Pilot, the Strange, and the Archer types would seem to be the future of the modern cruising yacht, as opposed to the Bermudian ideal with its hollow spars and great overhang. We see it pretty clearly indicated in the post-war craft.

On the other hand, the desire to have a gaff-less mainsail is no new thing. The Dutch were using it many generations ago, and we have only come back to where we started; for in ships, as in any other form of art, as in life itself, there are only a limited number of basic laws, and these keep exerting their influence or retiring. The conjurer tells you that every one of his tricks is merely the application of less than a dozen essential principles.

The novelist and the playwright confess that ever since the days of Sophocles, ever since the first yarn was told, right down to the latest cinematograph there are only thirty-six possible situations, and in practice these come down to less than a quarter of the number. So, in the same way, our forefathers found quite early the fundamentals of all that concerns hull and rigs. That which we can only do is to improve, to work along the lines bequeathed to us, try out this old plan and combine it with something else. But, at the finish, we still have to contend with the same conditions of sea and wind, so the results can never be as different as we might expect.

In recent years the effect of the internal combustion motor has exercised its sway not merely on the yacht but on the coaster, and it has had mixed benefits resulting therefrom. One of the saddest signs of the times is to see a topsail schooner or a fine, wholesome ketch running before the wind with a trail of exhaust smoke coming out. There is the legitimate use as well as abuse of the motor, but in these days when everybody is in a hurry, and the old type of seaman is passing away, and in some localities it is difficult even to get the right kind of crew for the district lifeboat, it is no good disguising the fact that a big change has come over the shipman.

You might point to those interesting fore-and-aft schooners and ketches, snugly rigged and fitted with sound motors, which are often seen coming down Channel from Holland. Instead of beating against a south-wester, or waiting for a fair wind, they hoist mainsail, sheet it in

tight, start the motor, and without headsails get about a point nearer the wind, so that they can often work a tide and get a nice long board, before going about. All the while the ship is travelling, and in practice the motor is pushing her up to windward. These craft often seem to solve a big difficulty.

But quite recently a Dutch expert delivered himself in no mistaken terms of this auxiliary galleot type. During the war many "motor schooners" were built in Holland, and much was expected of them. In the year 1919 one used to see quite a lot of them. They were decidedly limited as real sailors; but this did not matter, said their builders, for the engine would make up for that. On the other hand, a 70-horse-power engine for a 300-ton ship was regarded as ample, since there were sails. There was nothing wrong with the rigging, and the hull was strong. But actually, as time went on, it was found that there was almost incessant engine trouble, so the vessel was neither a mechanical nor a sailing ship. The result was that the percentage of such vessels lost was astounding, and it will suffice if we consider a certain 400-ton three-master of this type, whose name need not be mentioned. As a sailing vessel she was useless when the wind was less than two points abaft the beam, and the wooden keel which was added to her flat bottom between fore and mizzen masts improved her only slightly. Would she go about? She would not. Was she all right at sea? Those who voyaged in her said life aboard this ship was hell. After one voyage in her all hands, including the cook, deserted. Another

THE FORE-AND-AFTERS FINALLY

crew was got together, and she put to sea ; but she has never been heard of since.

The mistake is that a ship suitable only under power *and* sail is neither steamer nor sailing vessel. Let one fail, and both fail. Let her be driven on a lee shore, and the 70-horse-power motor will not get her off. And it is useless denying the plain fact that real ocean sailing ships which some years ago installed motors have had them removed. Why ? Well, it is true that in the doldrums the engines are worth while ; but it is asking too much to suppose that with all that top hamper, all that windage of yards and masts and cordage, anything but very powerful engines can drive the ship against the wind. Moreover, an engine takes up valuable space which might be utilised for cargo ; an engine means another couple of hands, too. Actually, to come down to plain facts, the long passages of these engined barques have been found no quicker than when the motors were not fitted. And it is stated on the best authority that the former "Vinnen" ships and barques made quicker passages than the present auxiliary schooners owned by that firm and already mentioned in a previous chapter.

The seaman naturally objects to something which is neither sail nor steam. It is only for the coaster and the yachtsman especially, whose navigation is among shoals, in tideways, in and out of harbours frequently, or anxious to get clear of the land into the true breeze, that the motor is profitable. There are exceptions such as in the case of those fine lifeboats now seen all round the British Isles ;

but it will be a sad day when sail has been allowed to own defeat and surrender utterly to mechanical power.

And yet, at the close of these chapters, let it not be said that the fore-and-aft has a history less romantic or less worthy than her elder sister the square-rigger. As we look back on the evolution of sea power it is true that this was won by the older type. But during the Great War there was that extraordinary phenomenon of the fore-and-aft rigged schooner, in the most mechanical of all ages, being used as a warship with guns and wireless and other equipment. Nothing in the story of the fore-and-aft rig can ever be more romantic and thrilling than the work of those mystery Q-sailing ships which performed such marvellous acts of heroism against German submarines. Events come and go with such rapidity that we fail to realise the achievements of our own time.

But when we look back on such craft as that three-masted topsail schooner *Mary B. Mitchell*, or those armed smacks which operated out of Lowestoft; or some of those armed trading ketches suitably disguised, or that steel-built *Horley* brigantine, it is something to be proud of that sail was deemed worthy to be pitted against submarines and electric engines. The action between that mystery schooner *Prize* and U-43, when that very gallant gentleman and fine seaman Lieutenant W. E. Sanders, R.N.R., won his Victoria Cross but almost lost his ship, is one of the epics which will for ever be associated with fighting under sail. Later on he was to be sunk and to go down gloriously to his death, but no yarn of the novelist can ever invent

a more inspiring story than that of this schooner *Prize* beating the enemy at his own game.

Or think of the capital fight which that other disguised schooner *Result* put up against a submarine in the North Sea. Second-in-command of the schooner was G. H. P. Muhlhauser, that fine yachtsman who set off round the world when the war was over and showed himself a sailor and navigator in every sense of the word. These disguised schooners and ketches were eventually given motors in order to assist their manœuvring towards the enemy, especially when the latter happened to be on the windward side. But it is as pure fore-and-afters that they are to be reckoned, for this was their main propulsive power. Nor did their utility confine itself merely to cruising and acting as live-bait. They were employed as escorts to convoys of sailing vessels. The *Probus*, for example, a brigantine of 179 tons, in June of 1917 sailed out of Falmouth with twelve other sailing craft and one steam trawler bound for Morlaix, the trawler being in the van, the *Probus* in the rear. It makes one stop and think when one considers that the days of the Napoleonic wars had come back to Falmouth, and sailing convoys escorted by a sailing warship had begun again. And they were fore-and-afters : there was just that difference.

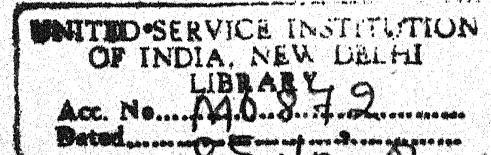
But to complete the story, up came a submarine the following day, as the *Probus* was doing her four knots through the water. The submarine had also disguised himself with sails as a ketch, and then the firing began. It was one of those beautifully clear June days when the

THE SHIP UNDER SAIL

English Channel was calm and peaceful, but there was too little wind for the *Probus* to have proper steerage way, and the duel was just like those duels which used to take place up till the middle of the sixteenth century between the mobile galley and the big-bellied sailing ship. *Probus* was practically becalmed, her log-line got mixed up with her propeller; but even in spite of everything she and the trawler had been able to save the convoy and make the enemy break off the engagement.

And so we end our inquiry into those many and varied kinds of rig which the ship in all ages and in all seas has employed during many hundreds of years. Every spar, every lead of a rope, every variation of sail become to us far more intelligible and romantic now that we have seen the origin and the different influences at work. Square-rigger, schooner, pilot cutter, yacht, smuggler, fisherman, trader—each has its own special history, each has contributed to bring about that most joyful of all sights—a ship at sea under sail. No work of man, no artistic creation has ever moved the emotions in quite the same way as this: for in the craft we love are beauty and mobility and strength. We cannot ask for more than this: human handiwork cannot produce more. So let us leave it at that.

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